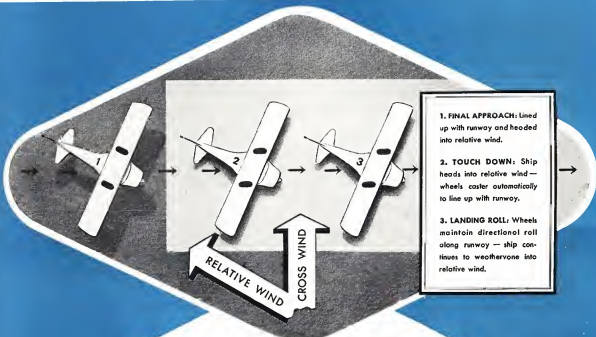


AVIATION WEEK

JAN. 10, 1949

A MCGRAW-HILL PUBLICATION



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—flight training in less time, with

less damage to wing tips and props—
increased revenue to flight-school operators. For complete information about the new Goodyear Cross-Wind Landing Wheel, write: Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.



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It is our responsibility
to merit continually
the confidence which the
aircraft industry
has placed in Honeywell
Aeronautical Controls.



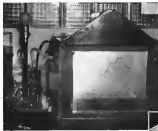
HONEYWELL
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Honeywell Aeronautical Controls is a Division of Honeywell, Inc., 300 Hudson Street, New York 14, N.Y. • Subsidiary of HAW (HAW)

Where Good Is NEVER Good Enough



Above: A finely divided, penetrating fog of oil coats bearing surfaces uniformly with uncontaminated preservative lubricant in exactly the right amount.

Right: In clean, air conditioned rooms, bearings move from station to station under automatic control—in finely sealed, leak-tight containers—here hands never touch them.



Above: Special electronic equipment, developed by New Departure, is used in constant research work directed toward the production of still better instrument bearings.

Right: Customer torque testing equipment—one of many different kinds of checking or testing devices in use verifying the outstanding uniformity of New Departure instrument bearings.



It requires long experience and a vast fund of specialized knowledge to uniformly produce really good ball bearings. But it takes something more than these to progress—to produce bearings of ever greater merit. This "something" is typified by the collective mind of New Departure, which, never content with "good enough", ceaselessly works to develop and improve—to make possible for tomorrow something even better than today's best.

nothing rolls like a ball...

NEW DEPARTURE
MICRO-INSTRUMENT BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

AVIATION WEEK, January 10, 1949

An Airline ticket...

SYMBOL OF SERVICE

Behind every airline ticket sold is a vast system of personnel and equipment — geared to provide pleasant, convenient passenger service, constantly seeking new improvements in air travel.

Take the matter of space reservations, for example. Plans have been reduced to seconds. New systems of real communication between cities reflect new needs the airline agents to control space automatically upon request. Airline service offers the passenger baggage checking from ticket office to destination. In-lay transportation to and from the field — delivery hot meals in flight — even green-room-lounge and diaper service. This is modern air travel.

And today's airline passenger enjoys a smoother, faster, safer, more comfortable trip because of developments of such companies as Sperry Gyroscope Company, engineers and flight-instrument makers that help the airlines

maintain schedule reliability in all weathers — help build public confidence in commercial flying.

Sperry automated products in use today on many airlines include the A-23 Gyrocompass for smooth level flight; the Automatic Approach Control for landings in all kinds of weather; the Gyrocompass and other flight instruments giving accurate information on position and direction; the Engine Analyzer that detects, locates and identifies engine irregularities in flight, saving valuable time on the ground.



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AVIATION WEEK, January 16, 1949

NEWS SIDELIGHTS

Decentralized Grading

CAA's new policy to humanize aviation by making airports more efficient to effect the not called for in the proposed reorganization, (in brought a bill to the machine grading of pilot and mechanic examinations).

The two IBM grading machine operators in the American Society of Mechanical Engineers section resigned recently and their posts have not been filled. Results may be to bring about additional "company building" in the seven CAA regions, by eventually decentralizing the grading system.

This would mean establishing regional examination centers with a minimum of seven machines and seven operators to do the work which two machines and two operators have been doing under an all-out centralized setup in Washington. Potential result would be more regional air traffic control, instead of one centralized set.

Chosen Instrument

Sen. Pat McCarran (D., Nev.) chose in the new Congress for chosen instrument legislation it set expected to make much-let air-boosting.

Sen. Edwin Johnson (D., Calif.), chairman of Senate Interstate and Foreign Commerce, the committee to which the bill will be referred for consideration, is one of the most vigorous opponents of the proposed Civil Aeronautics Administration bill. Johnson and the bill sponsor the White-River-McCarran-McNichols chosen instrument bill to 1946 and no one is getting it passed in committee.

Berlin Supplemental

U. S. Air Force will ask Congress for a supplemental appropriation to cover costs of the Berlin airlift. USAF figures the first five months of the airlift from June 25 to Dec. 1 have cost it about \$75,000,000.

Of this total \$18,252,280 were in direct operating costs, \$25,168,590 in support operations, \$22,019,000 in ground support, \$25,000,000 in fuel, \$25,000,000 in depreciation costs, and a \$21,012,200 reserve for increasing the operations.

USAF estimates that replacement of the cargo capacity of the air transport would now be approximately 10 times the dollar figure charged to costs. The supplemental appropriation will include an item in excess of \$100 million for new cargo transport.

Procurement Board

Aircraft manufacturers have been waiting patiently for indications of what a small group of top USAF generals have been up to for the past two weeks.

Gen. Nimitz, McNamara, Craig and Marshall have been discussed in the Pentagon for top secret meetings during the last days. The subject—aircraft procurement.

No Subcommittee

All aviation matters in the new Congress will be handled by the full membership of the Senate Interstate and Foreign Commerce Committee, according to its new chairman, Sen. Edwin Johnson (D., Calif.).

Johnson reports this to Aviation Week to counter a misunderstanding in taking him a step appearing in another aviation publication to the effect that he would appoint an aviation subcommittee, and that Sen. Owen Brewster (R., Me.) is sponsoring Republican member.

Johnson said that he has "definitely" decided against a special aviation subcommittee. In the last Congress, a group headed by Brewster functioned as a regular aviation subcommittee, although it was never authorized as such by Sen. Wallace White (R., Me.), who was former chairman of the full committee.

New Crash Report

Civil Aeronautics Board report on the crash of a United States DC-6 now by Maj. General, last agency will give another report on the Civil Aeronautics Administration on its investigation and safety administrative procedures.

Most cause of the crash will be credited to carbon monoxide poisoning of the pilot and cockpit after they disengaged their carbon dioxide from the forward baggage compartment.

Forrestal's Reverse

Washington observers have noted with interest Defense Secretary James Forrestal's request for additional powers to be vested in the Secretary of Defense. When Forrestal was Secretary of the Navy he vigorously opposed giving any

substantial powers to the new Secretary of Defense and was successful in getting the last Congress to strip his veto.

Now after a year of trying to run the National Military Establishment under the plan he originally proposed Forrestal wants more authority. He did not, however, request the authority to have the authority of the three services as he recently advocated in a ghost-written magazine article.

Skycoach Future

Potentialities of the skycoach in bringing air transportation within the reach of the average citizen's pocketbook have captured the imagination of Civil Aeronautics Board members. As a result, changes are very likely that the Board will approve additional proposals for genuine coach-type service.

This does not mean, however, that non-scheduled carriers which pioneered the lowest fares will get early hearings on their bids for certification. Big problems facing CAA in the skycoach picture is how to determine whether a proposed "coach-type" operation is just that and not a disguised way to sell first class. Differences in equipment, speed, time of departure, method of making reservations, meal service, and other items will be analyzed by the Board in weighing future skycoach proposals.

Inaugural Flying

Washington's committee for the Presidential inauguration last week went to nearby Virginia and Maryland private flying airports to arrange accommodations for a large number of private planes expected to come to Washington for the ceremony Jan. 20. Washington National Airport was to be restricted for scheduled, airline and military flights.

Meanwhile over \$200,000 in federal airport funds available for a clinics are just for small planes, within the District was going begging. Maj. Gen. Clayton S. Green III, chairman of the National Military Planning Conference, is blocking the use of the best available site, Kinross's Island not far from the Capitol, as the Air Force Base, despite its "unsuitable" CAA officials and other Washington aviation interests however have purchased the site will be used for a class in airport operations, which would greatly increase ability of small planes in the Capital area.



Creative engineering at AiResearch



Measuring and solving the critical problems of high altitude and high-speed flight has been the basic job of AiResearch for nearly a decade. As planes fly higher and faster, AiResearch engineers work constantly on equipment to compensate for the terrible heat, cold, and pressures encountered by the air, super jets and great transports.

1. AiResearch laboratory facilities include numerous temperature chambers where air intake up to 50,000 feet can be simulated and instruments designed to "test" the stress on equipment is being needed for a high-altitude test.

2. Many tests are required by the Army Air Force and Navy Bureau of Aeronautics for the various blockades of a new machine for use as a well-starter for an aircraft in being developed.

3. A new type AiResearch air engine for jet-powered aircraft is about to be tested in a refrigerated wind tunnel at 20,000 ft. AiResearch is currently producing 70 different high-speed engines in the field of jet and turbo-propeller engines.

4. Here an air engine turbine test cell is being made inside one of the many wind-tunnel test cells. AiResearch has one of the most efficient ever developed.

5. AiResearch engineers, designers of engines operating at excess of 100,000 r.p.m., solve the toughest problems involving high-speed, shock, supercritical expansion; is also available in creating compact turbines and compressor sections with high-speed rotors, air, gas and fluid heat exchangers, air pressure, temperature and other automatic controls.

Write: AiResearch Manufacturing Company
Los Angeles 45, California

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NEWS DIGEST

DOMESTIC

Howard Hughes called off sale of Hughes Tool Co., which owns controlling interest in TWA and Hughes Aircraft Co. Negotiations for the sale to a syndicate led by a New York investment firm had been underway most this week earlier.

Crews of an Air Charter Service DC-3 at Boeing Field, Seattle, killed 11 passengers and three crew members. Accident occurred on take-off from runway during heavy fog. Of the 30 persons aboard, 10 survived.

Wesley B. Nye, well-known anti-bureaucratic, was killed in a crash at Potts town, Pa., report is on his searching for an appointment at the Maine Air Museum.

New altitude record for gliders is partially has been set by Paul McCaskey, national soaring champion, at Bishop, Calif. Altitude reached, subject to checking by National Aeronautics Administration at about 27,000 ft.

FINANCIAL

North American Aviation, Inc. reports net income for year ended Sept. 18, 1948, of \$6,770,561, after taxes, on sales of \$94,782,759. In the preceding fiscal year, company showed loss of \$28,294 after carry-back tax credits of \$11,700,000. In the last quarter of the 1948 fiscal year, NAA deliveries totaled to \$54,712,095, more than double the sales of \$24,000,000 in the third quarter. Company's backlog fell from \$405,685,691 to \$150,307,678 as of Sept. 18.

Air Associates, Inc., reports profit for year ended Sept. 30 of \$71,355. This result was due to loss of Los Angeles plant at a profit of \$771,668. Without this non-recurring item, loss for year would have been \$96,577 on sales of \$1,965,917. Progress in restoring loss cut health of company was indicated by a second-half loss of about \$10,000, compared to first half deficit of more than \$75,000.

Tenn. Engineering & Mfg. Co. declared a 75-cent dividend per share of common stock, paid Dec. 30 to holders of record Dec. 20. It was first dividend of three-year-old company.

FOREIGN

British propeller rocket-propelled aircraft, recently reported, estimated speed of 350 mph. in tests of Commonwealth. Could meet new 5th wingmen.

India has signed bilateral air agreement with Ceylon, giving reciprocal rights between Bombay and Colombo and between Colombo and Trincomalee.

INDUSTRY OBSERVER

Correll's experimental flying test model for the XP-90 supersonic fighter has made more than 10 test flights at the U. S. Air Force Wright labs. Correll test pilots made more than 20 flights below they were able to land the plane at less than 200 mph. So far no extremely high air speeds have been attempted with the experimental model. Correll plans to use the flying mule to test various wing configurations and power plants for the final design of the XP-90.

Glenn Viny's new jet engine (GVT-1) has been testing some high Mach numbers in its flight test program proceeds at Patuxent River, Md. Test pilots report good stability and control characteristics at relatively high Mach numbers. Increase in the Navy's order for 19 of the Chance Vought speculators is already in the mail.

North American has delivered its second X-44 composite powered attack plane to the Navy. Both X-44s are now being at Moore. The X-44 is powered by two Pratt & Whitney Wasp Major reciprocating engines with an Allison jet engine in the tail.

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McDonnell is modifying its XP-85 jet parasite fighter to provide additional stability. The parasite drive shaft drive shaft vertical fins is requiring recent ones to provide more control surface while still allowing the fighter to fit into the forward bomb bay of the Correll B-58. Flight test program on McDonnell's XP-85 is continuing at Moore with company test pilot Bob Edlrich taking the new fighter up to 45,000 feet.

United Helicopters, Inc. has started a nation wide private demonstration tour of its "Heli 160" helicopter, with Los Angeles the first port of call and New York and Washington on the eastern end of the extensive flight tour. The helicopter is being demonstrated to the public to be a commercial helicopter manufactured in sales promotion. Previous projects it to give news, magazine and radio reports opportunity to be the captain and convince them of designer Stanley Heller's claim that the 160 has "inherent stability" and can be flown with hands and feet out controls.

Cal Aero Technical Institute's single place "baby jet" sport plane (Aerobee Viper, Oct. 25) should be ready for test flight next fall. A cockpit now is under construction, and control work on structural components will be under way before the end of this year.

CIAA contract to Flight Safety Foundation for investigating one of crew involvement in only one aspect of a thousand 757 accidents at this subject. The Foundation recently completed for a group of subjects a report which factors should be considered in determining rate of the crew. CIAA's report will tell how much of those factors should be made. A third, at yet uncontracted for report would be the third order of those factors.

French jet building a new swept-wing jet attack plane to be powered by a Bullfinch New jet engine. Known as the Nord 2280 the new jet plane is 44 ft. long, with a wingspan of 35 ft. French have also launched a new four-engine airplane, the Nord 4486, at Le Havre. It is a high wing transport plane of about 22,000 lb. gross weight. Total of 25 are on order for French Navy as patrol plane.

Royal Air Force will soon award a contract for 300 new primary trainers. Competition is now between Fieser Aviation Co. Ltd. with their two-seater Trainer and deHavilland's Canadian design. Fieser is building 10 Primers and deHavilland is working on five Chaparrals at their newly acquired Broughton plant.

Navy Revamps '49 Plane Buying Program

Vought Pirate and Martin Mauler dropped in revision; \$84,600,000 still available.

Navy has revised its current fiscal 1949 aircraft procurement program by eliminating the Vought F3U-1 Pirate jet fighter and the Martin AM-1 Mauler attack plane. The new program also adds 120 Vought F7U-5 Corsairs, new interceptors and four sub-sounders and four patrol aircraft.

The revised program does not complete the Navy fiscal 1949 procurement program, however, and Navy still has \$84,600,000 which is available for expenditure.

These additional funds are awaiting Presidential certification and will go for additional procurement of types already purchased, including more Corsairs (197), Vought F7U-5s, Lockheed F2V-4s and Douglas AD-4s and AD-6s, the latter three types powered by the Wright Turbo-Cyclone compound engine.

The revised program raises the total amount to be procured from 1155 to 1223, although the cancellation of plans for 90 aircraft in the process results in the addition of 137 previously announced new aircraft.

■ **Block Delivery-Elusive** plans for the Vought F3U-1 jet fighter remain unclear at the moment, although it is known that production delays occasioned by the transfer of Chance Vought assets to the Douglas Aircraft Co., together with difficulties in obtaining desired performance from the afterburner assembly have combined to delay the airplane more than one year behind present schedule. The afterburner installation has proved satisfactory in operation but its presence in the nacelle where not in use adds internal drag and reduces the efficiency of the airplane without justification. Previous development and test program difficulties have been solved by the addition of a large dorsal fin and the additional area of the afterburner.

Cancellation of the present F3U-1 order does not necessarily shift the outlook for Chance Vought, since the Navy is known to be extremely enthusiastic about the new F7U Corsair (Aviation Week, Nov. 29, 1948), and plans for

additional production beyond the 19 aircraft presently on order are in the mill. The Corsair is not expected to be in production status until the spring of 1950.

■ **Major Qualification**-The Martin AM-1 Mauler contract immediately followed extensive flight tests including recent carrier qualification tests aboard the U. S. S. Kearsarge. Although carrier landings have problems, particularly a low rate-of-roll, have been overcome by the use of small angle passes, the use and weight of the craft make further improvements in control difficult. Meanwhile, continued development of the Douglas AD-4s has resulted in two and three-quarter carrier carrier air groups in attack plane with the performance and load-carrying ability of the huge Mauler at some 25 percent less power.

The new AD-4 and AD-6 retains will carry radar and radar countermeasures in addition to usual early warning equipment.

Increased weight of the added new members is compensated by the Wright R-3350, 20-cylinder engine which provides 20 percent additional takeoff power and places the AD in the same power class as the AM with substantially less weight and considerably greater performance. Navy is having a trial of 518 Douglas ADs during fiscal 1949.

■ **New Attack Plane**-Purchase of 28 North American AJ-1 combat interceptors and 100 fighter interceptors gives the Navy the fastest airplane ever designed to tactical duty aboard an aircraft carrier. The jet engine will be used only for maximum performance conditions and will normally be shut down during the cruise portion of the mission.

The additional patrol aircraft, beyond the 82 Lockheed PV-1 types already on order include two specially-equipped Lockheed Constellation transports adapted for use in long-range search-and-rescue operations. The latter two types are also being adapted for use as a new type intercepting vessel and submarine

warfare electronic and combat equipment. The Wright Turbo-Cyclone compound engine will be fitted to the PV-1 to render the two-engine patrol plane the largest aircraft in the fleet.

■ **Helicopter Phase**-Helicopter procurement has been revised with the original commitment for 19 Sikorski HO4s being cancelled and split up into additional Sikorski HO4s, for use aboard battleships and cruisers, 5 Bell HUP-1 housing helicopters and 7 Sikorski HUP-1 utility types, prototype of which is now undergoing flight test at Naval Air Test Center, Patuxent River, Md.

Procurement plans remaining unchanged over that announced last June include: 517 Grumman OV-1, 179 McDonnell F2H-1, 23 Grumman AF-1, 49 Vought F7U-5, 16 Lockheed T-10 (TP-50C), two-seat jet trainers, 6 Grumman F4F-1 and the Grumman "Nighthawk" as a night fighter.

■ **More Corsairs**-Navy decision to buy 120 additional Vought F7U-5 Corsair intercepting engine fighters completes its current efforts to increase the number of fighters from 100 to 120 jet engine aircraft. While Navy favors the rugged jet for fleet climbing, high speed combat and patrol fighters, it does not yet believe that the jet is ready for long-range operations against shore-based submarines and ground striking of ocean targets. Instead several hundred miles from the coast.

Navy arrangements for procurement of 8 F4U-1B Q-12 (F-19) fighter interceptors through a transfer of funds to the Air Force engineers in effect, continuance of the F4U-1B production being visited by the Air Force. Navy production of 16 Lockheed TP-50C, two-seat jet trainers will supplement the 50 F4U-1B fighters obtained last summer.

Although these fiscal changes represent the latest Navy plans for aircraft procurement for fiscal 1949 funds, Navy points out that Congressional action in the fiscal 1949 budget request can force alterations in the program. For example, a slash in fiscal 1949 funds for such aircraft as aircraft maintenance, carrier operations, shore-based facilities, etc., could require a deferral in production plans for aircraft during the current year.

Forrestal Warns Of Schedule Lag

Warning that the aircraft industry is behind schedule in production of new planes to meet the requirements of the long-range expansion program of U. S. Air Force, was issued by Defense Secretary Louis V. Forrestal in his first annual report to the National Military Establishment.

Forrestal's warning echoes an earlier one issued last summer by Air Secretary W. Stuart Symington at the Air Force Industrial Area Board of Governors meeting which was held at Warhead, Va.

■ **Work Industry**-Forrestal blamed the industry's inability to meet the aircraft industry during the 25 years after V-J Day for its current inability to meet production schedules. He pointed out that during this period the industry was forced to operate on a "make it when you can" basis, which was not ideal for a healthy aircraft industry.

The provision of funds necessary to expand the aircraft industry by Congress last spring forced the industry partly prepared to cope with the multitude of production problems which presented themselves, Forrestal noted.

He noted in the most pressing problem facing the industry.

1-Tactical aspects of design and manufacturing inherent to the transition from conventionally powered planes to jet-type aircraft.

2-Expanded availability of essential materials and components, which materials produced by suppliers outside the aircraft industry who have concentrated in other types of production near the end of the war.

3-Maintenance problems resulting from the necessity of rapid expansion during a period of full employment and rising wages and other costs.

"These problems are not insurmountable but their solution requires intensive effort," Forrestal noted.

■ **Strong Air Power**-Strong emphasis on the need for developing both strength and tactical air power of the U. S. Air Force and Navy Aviation also featured the report.

Forrestal outlined much of the current emphasis between the Air Force and Navy Aviation to the fact that efforts of these services have not had the opportunity to become fully coordinated with the operations of their real services. He indicated that leaders of both services still have considerable to learn regarding the capabilities and limitations of each other's weapons.

■ **Risks Defused**-"Many officers in the Air Force honestly believe that the carrier will have a limited use in any war that we may fight in the future," Forrestal wrote, "and therefore that



NEW FEATURES OF CONVAIR B-36B

Convair latest version of the B-36, long range bomber, features special maintenance management for operation in a flying bomber or cargo carrier. Six of the cargo carriers (the B-36B) have been built by the Convair Corp. and the other four by the Douglas Aircraft Co. and the Boeing Co. of Seattle. Plans are to build the B-36B bombers by the Convair Corp.

Work shift to cover all maintenance, fueling and spot equipment test by the B-36B. Sixty-four bombers by Convair built and tested the cargo carrier. The B-36B long off-loading bomb bay gate opens below the fuselage by the Convair Corp. and the Boeing Co. of Seattle. Plans are to build the B-36B bombers by the Convair Corp.

large the maintenance of important carrier task forces. These missions are currently held, at least initially, by the Navy's regarding the capabilities of the long range bomber.

"As new wars," Forrestal reported, "that the concept of strategic air force has established itself as a central part of modern warfare although it before the Air Force must see to it that its tactical air mission capable of close cooperation with ground troops."

He also held the view that Naval air will have a part to play, in case one of these services have not had the opportunity to become fully coordinated with the operations of their real services. He indicated that leaders of both services still have considerable to learn regarding the capabilities and limitations of each other's weapons.

■ **Longest Job**-"Balancing the demands of these two aspects of air power and seeing to it that adequate funds are allocated to each is one of the most difficult tasks of the Secretary of Defense."

Forrestal reported that the Air Force has been given full responsibility for

development of strategic air power while Naval aviation is responsible generally for anti-submarine warfare. However he emphasized that the rapidly changing capabilities of aircraft and air defense weapons required a continuous re-evaluation of the roles assigned to each service.

Forrestal cited the participation of Naval and Marine aviators in the past on ground missions of Operation Castles in Florida and the fight at Air Force pilots of Navy carrier during the Battle of Iwo Jima. He also noted that the Navy and Air Force have been working together in the development of primary flight training for both the Navy and Air Force. He also noted that the Navy and Air Force have been working together in the development of primary flight training for both the Navy and Air Force. He also noted that the Navy and Air Force have been working together in the development of primary flight training for both the Navy and Air Force.

Some action along this line is possible to go into effect during the year.

be introduced by another Vietnam bill. ■ **National Science Foundation** to promote basic research in natural sciences and other scientific fields is proposed as bills introduced by Rep. Percy Priest (R, N. J.), Rep. Charles Wicks (R, N. C.), Rep. Otis Latta (D, Ark.), and Rep. Eugene McCarthy (D, N. H.). Swarthmore legislators have been passed by the House and Senate several times over the past few years, but did because of controversy over details. Early Congressional approval of the bill benefits is expected. Sen. Edward Brooke (R, Mass.), now chairman of the Senate Labor and Public Welfare Committee plans to have his group act on it during the first week of the session. ■ **Foreign Exchange** is to be introduced in bill introduced by Rep. Claude McDermott (R, Calif.), Rep. Paul McClellan (D, Tex.), and Rep. George Christopher (D, Mo.). Kinder's massive operations in Houston at Randolph Field, Tex.

■ **Sea Air Doms** would be opened to transport operations by strengthening laws under a statute proposed by Rep. Kenneth Celler (D, N. Y.). ■ **Foreign program** Rep. Carl Hays (R, Calif.) reintroduced his bill authorizing a civil air transport importation and development board composed of representatives of the Air Force, Navy, Civil Aeronautics Board, Civil Aeronautics Administration, and National Advisory Committee for Aeronautics to finance development work on commercial cargo and transport aircraft. ■ **Customs cooperation.** Airlines would be authorized to increase the over time operation of customs employees under another measure introduced by House.

■ **Department of Transportation** would be established under a bill introduced by Rep. Karl Stenholm (R, Neb.). ■ **NACA** would be authorized to sell \$100,000,000 of professional and scientific personnel under a measure introduced by Rep. John Lyle (D, Tex.).

ECA Aviation Aid Totals \$33.5 Million

ECA dollars for aircraft and aviation equipment totaled over \$33.5 million in five years that double the New Year figure of \$15.6 million. Of the \$19.9 million received for November and December, \$4.4 million was in the form of reimbursements for material already delivered. The rest is for aircraft, parts, accessories and ground handling equipment scheduled for delivery over the next six months. These orders are being placed now or will be placed in the near future.

November also saw four new contracts added to the list of those giving U. S. recovery money for their airlines.

They are Italy, Belgium, Sweden, and Belgium. ■ **Italy Largest Share**—Italy leads the biggest single aviation procurement commitment to date, \$5.5 million. Reports are that some of this money will be used to buy Lockheed Constellation from which may be the first step in evaluation of Italian postwar status of an overseas route to South America. Part of the money is for maintenance (parts and accessories) of Italian helicopter operating DC-3s in Italy and between Europe and the New Area.

Belgian case is for \$1.6 million for parts and equipment already delivered to Belgium. ■ **Sweden's share** is \$1.3 million to be used to pay for parts and accessories for S-18. This also is reimbursement, and some of it probably goes back to an original \$485 order for 17 DC-6s, four of which were sent to Australia and the rest of which have been delivered to Denmark, Norway, and Sweden.

■ **Irish Buy Parts**—Ireland received \$105,360, another reimbursement, for parts and equipment bought by another airline at the Irish Airlines company. Air Transavia, Ireland. Early in November, Ireland was scheduled for an additional \$57,000 for aviation material to be bought in Canada, but this was subsequently cancelled.

■ **Swedish Airlines** is scheduled to get a share of the \$107 million December-November aviation reimbursement for France. Plans are for Air France to buy two of American's DC-4s. Other U. S. aircraft will be furnished, Douglas, Pratt and Whitney, Wright, and other critical surplus property details. French aircraft deliveries also come in for \$1.5 million for aircraft and equipment. None of the money for this period was allocated for purchases under the U. S.

Netherlands gets \$1 million for DC-4s and DC-6s already purchased and being the country flies in \$10 million to ECA in return and, according to France in total aviation grants to date. Other totals to date: Norway, \$4.3 million; Denmark, \$1.1 million; Greece, \$450,000; French North Africa, \$30,000; Ireland, \$15,000.

Part specific order received by U. S. aviation equipment suppliers to appear on ECA's commodity supplies list went to United Aircraft Export Corp., East Hartford, Conn.

RFC Foreclosure

Reorganization Finance Corp. has announced foreclosure action on a \$2 million mortgage on the Warner McArthur Co., New York, manufacturer of airplane seats. RFC officials said the firm was delinquent on payments, and showed no hope of being able to meet its obligations.

Senate Approval Seen

For Mortgage Proposal

A superior sign has been taken in Washington to approve aviation charges for credit financing by banking institutions.

A conference, attended by representatives of the State Department, Civil Aeronautics Board, International Air Transport Association, Air Transport Association, American Air Lines, and banking agencies, agreed that the purpose of the International Mortgage Conference, held earlier this year at Geneva, should be recommended for Senate introduction.

The proposal first given the legal rights of a concept, namely, "providing reasonably fair prices, terms, and conditions for the purchase of aircraft, and to protect the owner of aircraft owned by a foreign power, and nations therewith, at least, has a face hand to assist aircrafts on foreign planes. The first step in the development of U. S. aircraft loan on owner ship rights recognized by foreign governments has resulted in a scheme by financial houses to extend credit for purchase of aircraft, which could be effectively financed by foreign nations. The International Mortgage Conference project, spelling out the rights of aircraft, is well in the hands of aircraft it is believed in which studies would be made of the industry.

The agreement announced of interested parties in the proposal indicates that Senate confirmation will be only one. Of the 15 nations attending the conference, only 20 have signed the proposal, but as yet, it has not been studied by any action.

CAA Change

Philip Moore, former CAA airport engineering service director, has been promoted to assistant administrator in charge of airports, by CAA Administrator Dr. J. Edgar Hoover. Mr. Moore, who has been acting assistant administrator, reports to the post of airport airport administrator.

Moore is a civil engineering graduate of Alabama Polytechnic Institute, and has been with CAA and its predecessor, the Bureau of Air Commerce, since 1911. Previously he was with American Telephone and Telegraph Co. and the Georgia Highway Department.

Official reports that Howard Rogers, assistant administrator for field operations, said that office was recently abolished, would take over a transfer from post marketing operations and field operations were described as pressure by a CAA spokesman. He said that decision on Rogers' appointment had not yet been made. Rogers has been attached to Ketter's office since abolition of the field operations post.

Monarch Certificate

Extended One Year

Monarch Air Lines has won a year's extension of its license certificate on the basis of continuously improving operating methods and the likelihood of further advance in the future.

CAA's decision to extend Monarch's license certificate, at least through May 18, 1950, enabled the airline to extend its certificate for the extended "Monarch Airlines" certificate for a year (American Wings, Nov. 29). Such certificates were issued in March, 1948, and a world have expired next May. 18 had the extension not been granted. Based at Denver, Monarch operates routes to Salt Lake City and north to Albuquerque, N. Mex.

■ **Activities Continued**—During the first half of 1949, Monarch and Challenge, which have common interests at Denver and Salt Lake City, consolidated traffic, sales, shipping, advertising, maintenance, overhaul and engineering activities. In June Monarch's larger base on life, CAA and the cooperative arrangements should result in lower expenses for both companies.

Monarch's DC-3 passenger loads during the 12-month period ended Aug. 31 averaged 39.9, a record, plane load-out for the same to Challenge's. For the year ending Sept. 30, 1949, MAA estimates it will have annual capacity of 525,075 (177 seats a week), operating expense of \$1,793,540 (39 seats a week), break even unit pay, and of \$1,386,765 (39 seats a week) and of \$1,386,765 (39 seats a week) per seat.

As of Oct. 1, 1949, Monarch was indebted to its president, Harold S. Dorn, for \$382,000 advanced to meet current obligations during past month. Dorn owns about 58 percent of Monarch's outstanding stock.

Project Privately Backed

Work on a show-length experimental plane design by Paul Otto Koppen, aeronautics professor at Minnesota Institute of Technology (Ansonia, Wis., Dec. 27), is being carried on as a private venture.

Koppen's show-length design is an experimental development which provided evidence of the Aeronautical Research Foundation at Boston, and still is being explained independently with private backing. The Foundation has no connection with the project, says Lynn L. Ballinger, executive director.

Prof. Koppen, however, was associated with the Aeronautical Research Foundation in its NACA-sponsored quiet airplane development project.

Rocket Course

A new course called "Rocket Flight Theory" will be offered in February by the graduate division of New York University College of Engineering.

It will cover various questions of the rocket, motion during and also burning boundary conditions and properties of permanent mathematical functions.

Course will be given by G. E. Cline, assistant professor of aeronautical engineering at the College of Engineering. Cline is also associated with General Aircraft Engineering Corp.

\$815 Million Program

For Aussie Defense

Australia will spend \$815 million during the next five years to boost its defense. The amount will be about equally split among the three services—Army, Navy and Air Force.

It is officially stated that the Royal Australian Air Force is rapidly approaching its approved peacetime strength. But even when it reaches this target, it will consist of only 3245 men and 144 aircraft. This force will be divided into two components, a basic defense force of 50 aircraft and 1152 men and a task force of 2361 men and 99 aircraft.

■ **Lesson**—The home defense force will consist of four fighter squadrons of night aircraft, one bomber squadron of night aircraft, one torpedo-bomber squadron of night aircraft and one sea mine squadron of an aircraft.

The task force that would be available for overseas operations will consist of two fighter squadrons of 16 aircraft each, two bomber squadrons of night aircraft each, one helicopter reconnaissance squadron of night aircraft, two transport squadrons of night aircraft each and one search squadron of night aircraft.

Besides, there will be a mixture of 470 operational and 688 training planes of World War II vintage.

Under present plans, the total available aircraft strength would be only 10 planes. Even if more and more transport squadrons are added to the collection, the force would comprise only 112 aircraft.



PACKET MOUNTS WINGTIP BADGONE

Built on the Packard C-119 wing is a set of tail hook and a mid-air release unit. Reason of the equipment is the way to move vehicle space in the wing. The dome contains motor for airspeed control.

amusement, aircraft detection and ground search equipment. Equipment weighs about 200 lb. and the weight is balanced by double wheel support mounted in the other wing. The colorless means low-

ing on the wing is also as used on the Packard C-119 "Pack Flank." This standard change was mandatory due to the difficulty. Landing "good" design of the unique wing design.

Metal Outlook

Aluminum firm official warns industry against mandatory allocations.

The aircraft industry, already warned that it faces a shortage of aluminum this year, is advised by the top economist of one of the nation's leading aluminum manufacturers not to seek government allocations to get a better flow of the metal.

Internal suggestions made in Washington for mandatory allocation of aluminum to the aircraft industry (AVIATION WEEK, Dec. 27), "ignores the long-range interests of the plane makers," is the opinion of Irving Laposwitz, director, economic research department, Reynolds Metals Co.

"If we start this only with top priorities and allocations to meet aircraft requirements," Laposwitz says, "the aluminum industry will never have the production necessary to meet the demands of a full-scale industrial mobilization." All the priority demands in the world cannot increase the total supply of aluminum.

► **Reynolds Statement**—Adding that much to the race to build up the ability to produce aluminum, Laposwitz pointed to a year-end statement by Richard S. Reynolds, president of Reynolds Metals, that declares aluminum production in 1949 will be four times as much as in 1948. "This year," he says, "supply is not likely to be sufficient to meet the demand."

Priority should only be used as the means of last resort when it is no longer possible to get greater production," Laposwitz comments. "It is a waste of resources to rely on priority protection to get the aluminum necessary for the present aircraft program which is a factor in the larger program needed in the event of industrial mobilization."

► **New Experience**—The Reynolds comment cannot be that the aircraft industry would stand much in gain by restriction of production. For one thing, he questions the wisdom of mandatory allocations in practice. It would be "a hard new experience for the country and cannot be expected to fit in very smoothly with regular producing and selling patterns of private business."

He points out, also, that other essential industries use large amounts of aluminum, and even military uses of the metal are not limited to aircraft. So

the amount going to the aircraft industry will still "be determined by the total supply available," Laposwitz says. "The best way for the aircraft industry to do its job is to step up total production. The bigger the pie, the better its chance will be of getting a big enough slice."

► **Pie in Three**—At Reynolds' demand, the statement, the aluminum industry has stepped up production greatly. It has "integrated with the first priority year in much greater development as would normally take two decades to accomplish," Reynolds says. "The industry now provides for uses in such direct and indirect employment as it did in 1935. Over 17,000 businesses rely on aluminum as an important material in their manufacturing operations."

"It is just that tremendous growth that has created much of the present difficulty," from "increased and put and put material," aluminum has spread out into general industry use. According to Reynolds, the only limitation as to use this year will be supply.

► **Waste Old—New** is still the motto, Laposwitz says. "In fact, the aluminum industry is worse off now than it was at the beginning of 1938. Some of the power it was then using has since been taken away."

Company Will Produce Pre-rotation Motors

Military and commercial interest in the C-119 S. Three electric landing wheel pre-rotation motor has resulted in strong financial support of Electric Motor Works, Inc., Los Angeles, the organization which will produce and market the device.

Two major markets—both military—appear to be in sight for the company: the heavy military transport or bomber, such as the C-119 and B-36, to which a landing wheel pre-rotation motor and wing streamer imposed by landing conditions and the emergency fighter which is subject to an extremely high air density of the damage caused by engine landing gear.

Success of the Electric pre-rotation motor installed in the main gear of the Lockheed Constellation is largely responsible for the formation of the new company. Pre-rotation of the wheels has been a slow to landing contact surface speeds that new users have been unaware of the amount of runway contact.

Direction of the new/developed company, Bruce Dahlberg, president of Colo-

res Corp. of Chicago, Jack Lane, president of American Pipe and Steel Corp., Alhambra, Calif.; Carl Horenstein, president of American Bells and Iron Co., Los Angeles, who is also president of Electric Motor Works; and Roy Delle, Los Angeles attorney. General manager of the company is Carl Dahlberg.

Gene Bore, the inventor of the drive, is chief engineer.

Steel Replacement

Four types of lightweight equipment capable of airborne transportation are being developed under a Navy program in which aluminum or other light metals are used in place of steel. Lighter metals are used only where they do not impede the performance or wearing ability of the equipment.

Equipment under development:

• A five-wheel 60-kilowatt generator in which weights about 2000 lb. in comparison with the standard set which weighs from 5000 to 6000 lb. It is now being tested at the Naval Construction Battalion Test Center, Port Hueneme, Calif.

• A six-wheel motor grader, which weighs about 17,000 lb. in comparison with the four-wheel 14,000 lb. wartime commercial grader weighing approximately 21,000 lb. It is being built for the Navy by the Austin Western Road Machinery Co., of Austin, Ill.

• An air-cooled 250-CPM air compressor, reported to weigh about 2000 lb. in comparison with the water-cooled 210-CPM air compressor machine used during World War II which weighed from 3000 to 7000 lb. It is being developed in comparison with the U. S. Air Force and other Navy branches which use air compressors for different purposes.

• A portable welding unit, reported to weigh half as much as the 2000-2500 lb. model previously used by the Bureau of Yards and Docks.

Start for New Year

Steel went coast airborne plants on record this year with a production of \$1,130,511,000 and 27,716,465 square feet of factory space in full production use.

Employment now stands at 307,740 for the seven companies—Boeing, Convair, Douglas, Lockheed, North American, Northrop, and Ryan—in one-fifth of peak wartime employment.

Major problem of factories is a shortage of engineers and toolmakers, which has been a slow to landing contact surface speeds that new users have been unaware of the amount of runway contact.

Direction of the new/developed company, Bruce Dahlberg, president of Colo-

NEW!

High-Temp Nut

HOLDS WITHOUT SEIZURE AT 1200°F.



Self-locking Elastic Deflection protects against VIBRATION! permits INTERCHANGEABILITY!

The extreme heat generated in exhaust manifold systems, turbojet and rocket and similar installations create strength and secure problems in ordinary fasteners—problems that are solved by ESNA's New Z-1200 Res and Anchor Nuts.

These new nuts share strength on the most famous of the General Electric T-16 turbojet engines and locking torque characteristics even after exposed to 1200°F. They are readily removed—do not seize the bolts as do chrome.

Further, the elastic deflection built into the Z-1200's locking device makes them interchangeable—because exact design sources lacking

temperatures within the tolerance range of Class 3 bolts.

ESNA Z-1200 Nuts—like all Elastic Stop Nuts—are designed for rapid field service replacements to simplify maintenance. They are substituting anywhere on a bolt or nut without frictional and from lock-washers or lock washers.

HERE'S A CHALLENGE—Send us complete details of your toughest locked trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information, write for literature.

Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents are located in many principal cities.

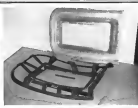


ELASTIC STOP NUTS



OVER 100 TYPES AND SIZES IMMEDIATELY AVAILABLE FROM STOCK

ENGINEERING



Light weight of plastic tooling is highlighted in this molding fixture (left) used to form sheet metal edge in a turbine engine wheel. Further to each, profile, and operations only in this would be major.

able with steel counterpart. Right: More than 50 new hours were saved in fabrication of this molding fixture used in manufacture of large part for F-14 Thunderbolt.

Plastic Tooling Proves Its Worth

Substantial savings in aircraft production costs effected with use of jigs, fixtures fabricated of molded laminate.

By Robert McLauren

An effective plastic material—molded laminate—has avoided the excess tooling field and promises not only substantial savings in costs but improved jigs and fixtures as well.

In using semi-integrated Fibreglas sheet metal under heat and pressure, Republic Aviation Corp., Farmingdale, L. I., N. Y., has developed plastic tools that are already producing savings at the rate of \$200,000 per year in the production of F-14 Thunderbolt fighters.

Republic engineers point out that plastic is by no means merely a "job fixer" material; do the steel used in actual tooling but actually produces a better tool at lower cost. Plastic tooling has already demonstrated these advantages:

- Complex shapes are most easily formed.
- Dimensional stability is greatly improved.
- Shrinkage problem is eliminated.
- Stiffed tool material can not be required.
- Tool making time is reduced 50 per cent.
- Deposition is greatly simplified.
- Resin and sand and repair is markedly simplified.

The company has actually replaced

all of its steel project tooling with plastic when wherever applicable, and is continuously seeking and finding new uses.

Applications already include drill and reamed gage, seating, checking, assembly, and substitution fixtures, and, to a limited extent, mold-forming and mold set fixtures.

In short, plastic has replaced steel in all but heavy forming, drawing, stretching or punching blocks and dies, and Republic engineers have already achieved production savings as noted below:

- **Preparation**—Fabrication of plastic tooling is a simple and rapid process. The operation starts with the common thermoplastic form or hard formed sample of aluminum bonded with plastic.
- **After careful study**, those portions of the tool which will ultimately be in contact with the part being formed are marked on the form.

This completes the portion of the job requiring highly trained personnel. Remainder of the work can be accomplished by the average worker, with least restriction.

A parting agent is then painted on the form as the same elsewhere in contact with the plastic.

By this plastic parting lacquer plus

sluminum strength in vacuum (1 part powder, by weight, to 2 parts heat-resistant oil) is used in the parting agent the plastic mold.

The aluminum strength in vacuum is used alone on wood, plastic, laminate, composite or metallic forms.

For metal molds, Central 4, Lac 444 is used.

The semi-integrated laminate is then laid across the mold in the pattern described by the marks on the form.

The cloth is Fibreglas DCC-1112 or 164 cut to shape at desired width. The material is stretched on a stretched 44-in. width and then cut to required, Fibreglas tape having been applied because of the necessity for stitching a wide variety of widths.

The Fibreglas is impregnated with the Post-BK-61 polyethylene methacrylate, although any low pressure polymer may be used.

The laminate is stored under impregnation until ready for use to prevent its setting in heat or under.

As many thousands of laminate as required can be laid on various areas of the mold to provide added strength to the tool.

Although intersections of two strips produce a double thickness when they cross each other, a skilled "in-mp" man can produce a staggered pattern produ-

ing a fixture of uniform thickness.

• **Molding Process**—The mold is cut placed on a suitable table where it is completely covered with a translucent tape for vacuum blanketing, which is securely clasped around the bed of the table to provide an air-tight joint.

A vacuum line is then attached to the bag and 20 to 28 in. vacuum applied. This vacuums the bag up tightly against the low rate stage and holds them in place and in shape.

The table is then rolled into a car cutting across even, which maintains 210 ft. for 1 1/2 to 2 in., depending on the use of the mold.

Actually, this curing time could be reduced to 1 to 2 hr. for small molds in less than 10 min. but exact time would have to be determined by experiment. This would provide a certain procedure because most molds are used only once to know the size tool and a dozen tools could be sent to the process.

For actual production lots of tools, however, the procedure might produce a satisfactory saving.

• **Finishing**—After removal from the mold the tool is trimmed and finished in required. About 4 in. a left around working edges of the laminate to permit trimming to accurate dimensions. Then lines can be scribed onto the surface mold, from which they are added into the laminate to provide an easy guide to follow.

Each time a provided by a high-speed loader, finish time by not need, setting or hand flag.

• **The tool** is to be used in a drill jig, drill guide tooling are mounted directly into the tool. If between cases then 0.0017 in. required, the loadings not mounted in small steel plates attached to the laminate.

These plates are painted in the mold and set themselves in the plastic during the curing process. After removal from the mold, they are attached to the plate in setting, holding as constant.

• **Dimensional Stability**—Simplicity and economy of this process relies on the available characteristics of the molding resin. Since the principal purpose of tooling is to provide consistent results, the permit shop output to be determined by the work and not by the worker, thereby creating maximum labor efficiency.

A universal cut time in tooling is required product design changes requiring tool reworking. Plastic tooling can be stored easily and the result is no material, drag, and other identifying change, part of the whole. Minor changes can be made in the part when needed, changes to provide the best and precise needed.

When major changes require reworking of the mold, the tool is applied to the mold with fresh plastic cloth and

plastic tooling over steel is its adaptability in forming of complex shapes. These shapes represent the greatest expense in steel tooling since they often require thousands of man-hours of handwork and machining.

Complex shapes require no cast curing time, these simple shapes and the "up" in the only part of the operation involving special drill and expert cut. The shrinkage-free characteristic of plastic provides accurate reproduction of contour.

Actual experience has shown that edge work, such as is experienced on steel plates, is actually less in plastic tooling than on nonmetallic cold rolled steel.

Republic makes it even impossible to shape change such as might be experienced by being dropped or when subjected to excessive load usage, and support properties are high.

Since the plastic saving in man-hours provided by plastic tooling is the fact that the basic cost of materials is actually substantially higher than steel. This cost irregularity is expected to be corrected in the very near future, however, by the constantly lowering cost of plastic materials in its seemingly competitive market.

Since drilled surfaces are not required in plastic tool making, labor costs are reduced and the availability of the required labor is increased. Actually, the frequent critical shortage in skilled tool makers is no longer a factor in plastic tooling.

• **The Production** of plastic tools can be represented by dividing the shop into seven groups, each responsible for a different phase of the operation.

1. The operator's work flow through the shop, improve time in efficiency and better production. Such streamlining is actually impossible in steel tool shops in which it is customary to have a single individual to carry his individual part set through to completion.

Simplicity of plastic tool making also permits breakdown of the work to a point such judgment on the part of the operator necessary and almost impossible in steel tooling. The permit shop output to be determined by the work and not by the worker, thereby creating maximum labor efficiency.

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The plastic tooling program at Republic began in the fall of 1942 under the direction of Leonard Witman, senior plastic engineer of the company.

This initial effort ultimately led to the adoption of low pressure molding technique as a standard tool manufacturing process.

Although considerable progress has been made in the application of molded laminate to actual tooling, it is apparent that only the surface of this activity has been scratched. Future developments in this area require the new method into industrial importance in the industry.

The range of applications is limited only by the imagination and present development in this area.

In addition to economic and strategic importance in the rapid expansion of volume aircraft production, simplicity and low cost of the tooling under it readily applicable to small scale production—tools for a single experimental airplane.

Because tooling investment will be low and tooling change simple and economical to make, reworking design changes in the part when needed, changes to provide the best and precise needed, thereby overcoming one of the obstacles to technical improvement in production aircraft experimentation during World War II.



Engorged lanes of Stratocruiser outfit are seen by Boeing engineer Ernest Norling.

Stratocruiser: Built for Comfort

Passenger convenience supplemented by engineering refinements that increase transport performance.

Part of the giant effort to go into commercial service, the Boeing Stratocruiser gives promise of being, for a long time, the mostroomy size of airliner which will be economic to operate over long-haul routes.

The plane's present maximum gross weight is 342,000 lb, but the Civil Aeronautics Administration has approved the basic structure for a gross of 417,000 lb. Thus, higher net weights can be used without change in major structure of the wings, body or landing gear, allowing increased useful load.

Detail dimensions of the craft are only slightly larger than those of transport now in use by the airlines, but its ability to carry a bigger useful load (83 percent of gross weight) further (4200 lbs normal range) flies and at lower cost, it is noteworthy. It also does the increased size require no great addition in handling, ground service and operating personnel over other low-range transport.

The Stratocruiser can meet direct flying needs at the very low load factor of 16.4 percent, equivalent to 10 passengers at 5.5 cubic feet per cubic foot one ton of cargo at 75 cubic ft a ton plus, leaving 94 percent available for indirect revenue and profit.

With cruising speed of 340 mph at

25,000 ft, using about 70 percent power, it will cut air time substantially between world cities. It is noted to do the New York-London run in about 11 1/2 hr, New York-Tokyo, 22 1/2 hr, San Francisco-Honolulu, 7 1/2 hr, New York-San Francisco, less than 12 hr, Miami-Buenos Aires, less than 15 1/2 hr.

► **Layout Is Plentiful**—Although the plane can be equipped to carry as many as 124 passengers, maximum seating in the 75 will now seldom be a full 50 passengers, and some will carry only 36. Seating is provided in the nose, in upper deck, while a 500-in. ft arm on the lower deck is reserved as a lounge. To carry a greater number of passengers this lounge would be furnished with conventional seating.

The lounge, reached by crawler stair from main deck, can accommodate as many as 14, but for extra comfort, five sections have specified seating for only 14 and British Overseas Airways Corp. has specified 12. Seats are arranged in horseshoe shape, with a circular removable table at the forward and service bar is located under the stair way and a rear door gives direct access to a 165-in. ft baggage compartment as well as the auxiliary lower rear air intake.

Main deck is divided into five air

tern-flight cabin, forward fuselage section seating eight persons, men's and women's lavatories, restrooms on opposite sides of the aisle, main toilet, and galley.

Main entrance is on left side, midway of the main cabin, with the stairway to the lower deck off at the entrance. Stairwells, stations, with seat, desk and microphone phone as well as light, temperature and humidity controls in rear of cabin, with coat racks near it on both sides.

► **Cabin Facilities**—Main cabin, 55 ft long, 115 ft wide and 8 ft, 9 in high at the nose, has Boeing-designed built-in chairs spaced 46 in apart. Each two sets of chairs make into a lower berth 74"x42 in, a single room for two persons, with headroom enough to sit up. Mattresses, cushions, blankets, pillows, etc., are stored in the upper berth (75"x40 in), which swings down from the side walls and ceiling. Conversion from daytime arrangement can be quickly made, with sleeping space for 24 to 45, as the airline wishes.

Seating aft of the main cabin deck is with luxury day chairs. These chairs, as well as those which make into berths, are adjustable from vertical for reclining, have sponge rubber upholstery and built-in absorption seats to eliminate transverse vibration. A panel on each seat arm includes seat warmer, reading light switch, ash tray, seat adjustment switch, reclining chair button, "accouped" tips and stowage for service table legs. "Wedge" function, quickly moves the reclining chair back for special flights or conditions.

► **Interior Decoration**—Appointments very set only from airline to airline but, in the case of the Stratocruiser Airlines Service, from plane to plane. Colors and materials have been selected to reduce air sickness and passenger fatigue, the designers trying to induce relaxation in color values between sky and the plane interior. Light-foams are used in upper half of cabin, known color on seats and floor.

► **Northwest Airlines**, whose Stratocruiser will fly the northern route to the Desert, will feature warm colors. Boeing expects that other passengers will fabric in a woven stripe design, rough-textured, dove-dying upholstery.

United Airlines, flying to Honolulu, will have a Hawaiian motif in the lounge, with bulkheads faced with palm leaves from products of the Paradise tree with bamboo floor strips. Lounge outlays will feature colored design of Hawaiian fish, and puppets.

Lounge seats of American Overseas Airlines will be white leather.

BOAC Stratocruisers will feature English oak, plywood paneling in dining room, galley and kitchen.

Pan American Airlines will divide its passenger cabin into three sections, with

beige curtains and blue-green seats in two of them, blue-green curtains and beige seats in the other.

SAS planes will have hand-woven curtains made in Copenhagen. Lounge walls in two of the ships will bear hand-painted appliques, stylized animals, trees and human figures on dyed oil wood material. Curtains in main cabin will be in striped variations in more colors than a airline.

Plushes are used in the cabin walls up to the windows and ceilings. All fabrics are flame-resistant, rubber proof and colorfast. A flooring of laminated plywood and dural is covered by sponge rubber and carpeting.

Planes of SAS and UAL, each have a single stairwell at each end, leading or sleeping, with private lavatory. SAS and PAA each have a lounge compartment forward of the dining room, seating four or sleeping three. NWA has two such lounge compartments forward.

The luxury compartment is contained, while the stairwell is walked off.

► **Galley Details**—Planes ordered by PAA, NWA, AOA and SAS have a 170-cu ft galley, largest ever installed on a commercial aircraft. Nearly all of the main cabin UAL and BOAC are installing the galley modules.

A hatch in the starboard side of the fuselage permits food boxes to be loaded directly into the galley. Basic unit includes four cold-water boxes, along the port side just inside the galley door, each holding 44 complete frozen meals.

SAS has eliminated two of the boxes and the larger outer one installed for the use of the airline's in-flight service. The use will have four compartments from which to serve trays on which meals will be set up in the airport concourse prior to loading.

The galley is of aluminum with the exception of three working surfaces of stainless steel. A 17-in. ft subgenerator will carry portable, soft drink, ice cubes and 50 lb of wet ice. Additional food may be stored in two dry bins beneath the cold-water boxes.

Four of the six airlines which have ordered Stratocruisers have the galley equipped for the Macon load quantity—two 12-wheel units to produce 24 lbs net weight at a time. In addition, there is a wing for a third unit.

Each galley will have seven 3-gal liquid containers for tea, juices, soups and drinking water, each with electrical outlet and switch for heating.

Liquor will be stored in two compartments beneath the portable cupboards. Cocktail glasses may be placed in four compartments below the galley and above the food boxes, behind roll-up doors, each type of glass fitted into its own slot.

STRATOCRUISER—BASIC DATA

Wing		
Span	143 ft 2 in	
Area	17,719 sq ft	
Aspect ratio	11.8	
Wing loading	110 lb/sq ft	
Type	High lift/low drag, two-spar, stressed metal construction	
Plan		Positive taper, constant
Wing leading (143 ft 2 in)		
Wing trailing (143 ft 2 in)		
Fuselage		
Length	110 ft 4 in	
Height (Port condition)	22 ft 6 in	
Height (Vertical and slant down)	22 ft 6 in	
Maximum width	11 ft 6 in	
Maximum depth	11 ft 6 in	
Ground clearance	11 ft 6 in	
Maximum gross weight	342,000 lb	
Maximum takeoff weight	342,000 lb	
Performance		
Cruising speed at 25,000 ft	340 mph	
Maximum operating altitude	35,000 to 37,000 ft	
Maximum climb rate (at 25,000 ft gross weight)	10,000 ft/min	
Maximum rate of climb (at 25,000 ft gross weight)	10,000 ft/min	
Rate of climb (Port engine out, maximum conditions)	14,000 ft/min	
Rate of climb (Starboard engine out, maximum conditions)	11,000 ft/min	
Stalling speed (at 110,000 lb gross)	70 mph	
Range		
Maximum (zero wind, sea level conditions)	10,000 mi	
Maximum (zero wind, sea level conditions)	10,000 mi	
Maximum (zero wind, sea level conditions)	10,000 mi	
Takeoff		
C.A.R. field length at sea level (110,000 lb)	2,800 ft	
C.A.R. field length at sea level (110,000 lb)	2,800 ft	
Landing		
C.A.R. field length (sea level) at 110,000 lb gross	2,800 ft	
C.A.R. field length (sea level) at 110,000 lb gross	2,800 ft	
C.A.R. field length (sea level) at 110,000 lb gross	2,800 ft	
Weights		
Maximum (gross)	342,000 lb	
Maximum (gross)	342,000 lb	
Maximum (gross)	342,000 lb	
Maximum (gross)	342,000 lb	
Propulsion		
Four 14 1/2 ft Wing Motor 2-1450 2200-40 25 cylinders, air-cooled, detachable radial		
Maximum power (with water injection)	5,500 hp at 2100 RPM	
Maximum power (dry)	5,500 hp at 2100 RPM	
Maximum maximum power	5,500 hp at 2100 RPM	
Maximum cruise power	5,500 hp at 2100 RPM	
Maximum cruise power	5,500 hp at 2100 RPM	
Four high altitude engine modules and conventional engine air flow		
Propellers		
Custom blades, 19 ft 4 in diameter, at Hamilton-Standard 14 ft 4 in diameter		
Both four-blade, constant speed, full-authority, reversible thrust		
Landing Gear		
Type: Retractable, nosewheel, dual wheels		
Main wheel span	11 ft 6 in	
Wheel track	11 ft 6 in	
Wheel track	11 ft 6 in	
Superequipment		
Low level fuel pressure up to 10,000 ft		
High fuel pressure up to 10,000 ft		
Weathering		
Weathering		
Weathering		
Weathering		



"Should we have more aluminum assemblies?" As higher production becomes more important, you may have to answer that question. Brazing has proved to be a fast, cheap, neat method for joining numerous parts such as superconductors, dent work, air ducts, heat exchangers, radiators, tanks, instrument boxes, etc. Aluminum assemblies can be brazed which cannot be fabricated by other methods because of inaccessible joints. Costs are low. Production rates are high. An unlimited number of joints can be made in one assembly. Distortion is minimized because of the lack of localized heat. Joints are neat—generally an inch is required rather than five removed. Weight saving up to 50% is possible by replacing castings with joined aluminum assemblies.

Typical air self-jigging assemblies of 25, 35, 505, 645

and special Alcoa Aluminum Alloys can be brazed by either of two production methods in a hot air furnace, or in a vacuum furnace furnace. The latter method is preferred for assemblies that lend themselves to this technique after removal from the pit. All assemblies should be designed so that differences in wall thickness of the detail parts is as small as possible.

MUCH OF THE PROMISE WORK on aluminum brazing has been done by Alcoa. Complete Alcoa light-metal brazing knowledge is at your disposal. Send for your copy of the useful manual, "Welding and Brazing Alcoa Aluminum." Or contact your nearest Alcoa sales office. ALCOA/USA, COMPANY OF AMERICA 2153 Gulf Building, Pittsburgh 16, Pennsylvania.



AIR INJECTION ASSEMBLY
Welded: 100 parts in 2 to 3 hours.
Brazed: 100 parts in 2 hours.



FLANGED TUBE ASSEMBLY
Welded: 100 parts in 2 to 3 hours.
Brazed: 100 parts in 18 minutes.



OUT-TAKE PUMP WICK PUMP
Welded: 100 parts in 2 to 3 hours.
Brazed: 100 parts in 45 minutes.



MAGNETIC BLAST TUBE ASSEMBLY
Welded: 100 parts in 72 hours.
Brazed: 100 parts in 14 minutes.

ALCOA FIRST IN ALUMINUM



The tank will be provided with self-cleaning hot and cold water drains and a pop up drain.

Perforated piping is used to solve the problem of water in solid parts of call, because in some cases the water acts on metal piping to produce unsatisfactory results.

A "vacuum blind" arrangement of the doors to main cabin opens to become a series of the thicker, opening and service.

All waste matter will be disposed through a small hinged door in a movable panel beneath standard work counter. It will be caught by a bag attached to the back of the panel, outside of the galley trail.

► **Dressing Room, Lighting**—Each of the two dressing rooms contains 225 sq ft of space. The women's room has two wash basins with hot and cold running water, toilet dispensers, dental basin, individualized mirror with two revolving dressing tables and extra large mirrors. Each man's room has two large dressing and disposal facilities, ash trays, etc.

The man's room, big enough for five or six three-levels, dental basin, folding coat hooks, large mirror, first aid kit for electric shavers, etc. Toilets have sliding doors and are available.

Separate lavatories and toilet facilities for crew as well as of flight deck.

The lighting system has 411 separate lights, 70 of which are main cabin, stage, pilot and dressing room—arc fluorescent, incandescent, and others with standard incandescent better than fluorescent lamps and give even light with less heat and less wattage. Over 800w. are used by these fluorescent lights as against the 2,500w. needed to provide the same fluorescent light intensities.

The glazing system is such that the maximum fluorescent light intensity would prevent electric charge which would prevent start and last. Directional lighting lamps furnish each passenger with 14 foot-candles of light at reading level from a 20w. lamp.

► **Pressurization**—The automatically controlled cabin pressure system maintains an actual condition up to 15,000 ft. At altitudes above this cabin static pressure conditions rise gradually—to 3000 ft at 20,000 ft altitude, 5500 at 25,000 and a maximum of 5000 ft at the 30,000 ft level. In closed altitudes, regardless of the plane's rate of ascent or descent, this change can be limited to a maximum of 200 ft., reducing the possibility of ear discomfort.

Pressure is developed as a direct bleed from the General Electric turbo-propellers, charged, and for the first time as a conventional method.

Pressurization standards are chosen to be much higher than on any other pressurized transport, the plane's pro-

cessary structure being designed to withstand 16 g., although the maximum pressure differential to actual operation is only 6.55 psi. A double rubber strip seals the doors. Stress is lower the cabin is regulated amounts through venting, going in the dining room and galley.

Pressure is adjusted by two cabin regulators located in the secondary compartment beneath the control cabin. Although the regulator operates automatically, the flight engineer has on his panel a cabin pressure selector to hold pressure at any desired, and a cabin altitude change selector for air during ascent and descent.

► **Air Conditioning**—Cabin air is continuously heated, cooled, humidified, dehumidified and filtered in flight and on the ground. A continuous flow of conditioned air, at the rate of 40 cfm. per passenger, means in only the walls and double-paneled windows, floor and ceiling 24 sq ft ducts and venting, and front-free glass. Approximately 75 percent of the air is 7000 cfm., is recirculated, with 925 cfm. of fresh air added.

Temperature of 70 deg. can be maintained in the cabin with outside temperatures as low as 68 below zero. At the other extreme, the cabin can be cooled to 35 deg. below ambient temperature, a greater differential than is permitted elsewhere.

An hour glass, drawing room and cargo compartments is exhausted directly outside, thus eliminating fumes and odors. In passenger cabins, and air is drawn off at floor level, pulled off cabin, cigarette smoke, air, downward away from the passengers. Smoke and odors are filtered from the air as it recirculates, with a constant change of air in the cabin every 90 sec. The filter also removes a very large percentage of airborne bacteria.

During flight, ventilating air is brought from the nacelle into the forward cargo compartment where it passes through air filters and then through two 200,000-ft. air conditioning units which, like the two located in the rear cargo compartment, can operate locally for ventilation, or in closed in double stainless steel ducts in a pressure maintenance. The last is automatically shut off if they are not working properly. Copied as air from the turbo-propellers usually provides all the total necessary up to 30,000 ft.

After leaving, scrubbing air is ducted to the air recovery area, where it is mixed with the recirculated air and carried through a duct system raising the entire length of the plane just before main cabin flow.

It then passes between the cabin air ducting and the surrounding blanket between each of the compartments

hole throughout the cabin length as the cabin. During ascent, it enters the main cabin through the exhaust duct, then downward through the cabin and is exhausted through galleys located at the structure of the cabin wall and floor with the return air duct formed by the cargo compartment ceiling and control cable guide.

On the ground, fresh air is obtained by means of two centrifugal driven blowers, one located in each wing, exhaust of the exhaust ducts. ► **Humidity Controlled**—Cooling of the cabin is achieved in the same manner as flight and on the ground. A compressor and a condenser are located in each overhead nacelle, and an evaporator in the air recovery unit, through which return cabin air passes. Control and operation is automatic, with the crewmembers selecting desired temperature.

The air recovery unit consists of a motor driven compressor, filter, activated charcoal odor absorber, evaporator and means for adding moisture for humidity control. The air filter is replaceable and utilizes a 200-grain molecular sieve.

Purpose of the humidifying system is to maintain 73 F and 20 percent humidity, giving an approximate actual humidity of 68 F. The system is controlled by a temperature-sensing device in main cabin air ducting, with alarm cabin levels are triggered and maintain is needed.

Once in more of these water nozzle automatic sprayers, depending upon cabin humidity, and gauge spray rates are controlled by a humidity sensor. The humidity sensor is the humidity sensor the permitted level.

Water is obtained from the main water tank, which carries 50 gal. for air cabin pressure plus 70 gal. for galley, drinking, and other uses. The water is drawn from the tank into the cabin air ducting in front of the flight engineer's seat as an alarm the turbo-propellers maintain any trace of carbon monoxide.

► **Emergency Facilities**—Facilities for emergency and maintenance allow ample room for the biggest maintenance job normal size work without twisting or spreading. Every compartment is easily accessible, even in flight. Openings are located by emergency exit signs to equipment by the nearest possible route.

Grouped panels and simple tubing and wiring run parallel throughout, in dining compartment, restrooms, etc., so perform work simultaneously. The 35H, 35m vertical fit is hinged at the body line so it can be folded without disconnecting console or pedestal, to permit hanging.

One man can change the 35m in 10 min, two men can change a prop in 2 hr., 45 min, or a carburetor in 2 hr. 55 min, while four men can change a power package in 10 min.



Instrument panels (top left) large and so convenient for eye straining. Hatch (top right) is used to check status. Lounge (bottom left) in F-4s is comfortable. Pilot's seat is adjustable (bottom right) to hold five tons.

per. Because of the 19 windows are single-pane glazing designed by instrument for no reflection.

Normal procedure is made for a five-man flight crew with an extra seat to pilot's left for an observer. This chair pivots so that it can be swung out of the way of the pilot when he is working or leaving his position. All seats are adjustable for height and position, while pilot's and copilot's seats are also adjustable for reclining and incorporate heating and arm and head rests. Head rests also are provided for each pilot to use during flight on a swivel joint.

Steering control, located in the left of the pilot, controls angular movement of the nose wheel by hydraulic actuator for turning and ground movement. It can also be used to aid in maneuvering crosswinds during landings and takeoffs at low speeds when the rudder is less effective. Parking brake is located on the steering column.

Instrumentation, Lighting—Pilot's instrument panel is located just below the normal eye level allowing unobstructed ground visibility as low as 10 to 40 ft

directly forward of the plane. This is particularly an advantage for instrument failure because of the constant distance of the line of sight between instrument and cockpit when looking through an everted flight instrument or, arranged to reflect, through a mirror of one instrument required for reference to instruments. Instrument panel includes a new three-dimensional fuel control panel incorporating a fuel flow diagram.

A full-sized metal window, clamped in place and sealed with rubber against the wing's bubble-type airframe, its structural covers of two layers of glass with a layer of transparent plastic between.

No separate cross-light from the plane is equipped with red and white cockpit lighting. A white light used to assist in refueling plane is gradually changed to red light during flight. As soon as possible, the red lighting cuts out to white. Radio operator and navigator get light to assist their ground support work. If pilot or copilot has used to use them, he can turn their lights from

white to red for duration of the night that maintaining the right amount of distance between the two.

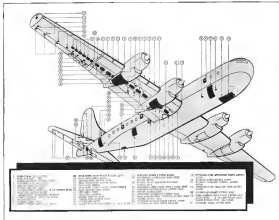
Passengers in the cockpit area are illuminated by red lights to maintain the crew's awareness of the status of the aircraft.

Crew egress is the flight deck through a hatch from the lower forward cargo hold. This door does not have to go through the main cabin.

Safety Straps—Each pilot's high crash seat is equipped with the plane's complete shoulder harness to hold the pilot in place in the event of a crash landing.

The plane is designed to withstand even higher load factors than the G-4, which is designed to withstand 9 G's. The G-4 is designed to withstand 9 G's. The G-4 is designed to withstand 9 G's.

The rudder is driven by a power boost system and is controlled through a power boost system. The rudder is driven by a power boost system and is controlled through a power boost system. The rudder is driven by a power boost system and is controlled through a power boost system.



Maintenance and servicing facilities are emphasized in Phantom with numerous access panels, both inside and outside aircraft. Openings are located to give access to equipment by shortest possible path.

to increase, customers by between rudder pedal action and movement of rudder, an accelerometer is installed in the tail and the boost control valve.

Pressure to operate the boost flow is tapped directly from the accelerometer and not from the pressure lines. The boost is capable of moving the rudder 70 deg per sec with outside loading.

While main boost system has tended to operate when disturbed by air gusts or abrupt movements of pilot's controls, it has a characteristic delay in moving the boost system only to pilot's controls, and not to an increase in the rudder, and in clearing the "hot spot" or live position of the boost control valve.

A fire-detecting valve is provided for each power package installation baggage compartments and heater compartments. The detector and extinguishing system includes a control for shutting the engine and discharging the CO₂. The battery for the engine and most of the combustion heater are in the main wheel well, where this can be reached from the outside through

"hot tanks" which change color if the tank has been damaged.

Use of a bleed-decoupled half-houring-type anti-icing system makes possible operation of the leading edge in use without an important safety factor because it enables the pilot to "clear" the iceplane immediately after takeoff, making possible a faster climb-out. Each engine develops 1500 hp at takeoff with water injection.

The nose pitch feature of the C-4 is, however, as the nose is raised, the pitch is increased to 100,000 ft. The pitch is increased to 100,000 ft. The pitch is increased to 100,000 ft. The pitch is increased to 100,000 ft.

For right loadings a 600-hr sealed nose light fixed into the main series of each wing can be used to illuminate the aircraft.

Other safety features include thermal protection of wings and empennage, with an air-to-air heat, shut down on the

nose gear as well as on the main gear, 15 separate sources of electrical supply for the basic flight requirements, large area of the vertical fin, making possible "hands off" flight with even two engines out and sufficient to allow any pilot control even in case of engine failure at 10,000 ft.

Freight Accommodations—Cargo area, partitions, on the lower deck, have a normal capacity of 9000 lb. Each has its own loading door, with rills at track and height, thus permitting direct loading and unloading.

How compartment, intended primarily for baggage, has 900 cu ft and a loading door 50x16 in. Integral steps in the door, which lets down to ground level, provide entrance. The door can be opened from either side from within by using a safety latch and pressing a button. A red light glows at the flight engines station until all doors are closed.

Main forward cargo hold has a volume of 870 cu ft. Its loading door also has integral steps, measures about 66 x 44 in.

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Self-Contained Oil Control Assembly for Propellers

An integral oil control assembly for hydrostatic propellers—incorporating in a single unit all fundamental operating functions of the prop. together with oil supply—now being delivered by United Aircraft Corp.'s Hamilton Standard division for incorporation on airplane (cont.)

Applicable where propeller operation using engine oil was not to desirable, the installation will permit use of a fluid reservoir suitable, generally for the pump. Containing large capacity pumps and operating with lighter oil, the device is reported to allow utilization of propellers having larger, wider blades for higher power absorption and greater thrust.

The new assembly, comprising a complete actuator unit and oil tank mounted in a compact section at the rear of the hub. Included are hydraulic pump, governor, manual valve for lubrication and venting, and control valve.

Arrangements which the assembly will be installed include, the Boeing C-97 Stratofreighter, Fairchild C-119 and R-10 (Naval) Packets, Douglas C-124 Globemaster, Grumman SA-16 and JRF-1 (Naval) Allotment, and C-125

NEW AVIATION PRODUCTS

Remote Control Boost

Electronically controlled boost made in York & Towne Mfg. Co., Tulsa, Ok., for operating remote engine plant from over high frequency equipment and along into vibrating out over pilot yards, is intended to eliminate use of long electric control cables. Electronic transmitter plugged into plant power lines supplies energy and current after boost. For boost control, there are five dynamic tubes, or, if desired, other type of audio frequency generators, each of which generates low audio control frequency to cause operation of one particular boost machine.



Egged Auxiliary Light

New extension band light "Nogard" is made by Noctek, Inc., 124 West 4th St., Los Angeles 13, Calif. Since all installation is made of non-metallic materials, device is sparkproof and used for ground or elevated lamp guard, made of high impact material, throws off red glow when lighted, to serve as safety signal. For additional safety, glass phosphor unit is available that will glow several hours after light is extinguished. Special triple and multi-ported characteristic and permits use in underwater operation. Pyrex lamp is resistant to welding quaternary and sub-zero weather, and tungsten filament is hermetically sealed (25, 50 and 100-ft. lengths) are made of Noctek Pyrex. Can be locked into socket. Diameter is 3 1/2 in., length is 12 1/2 in., weight is 4 lb. 10 oz.

Does Airport Odd Jobs

Utility tractor for diverse airport work on small and large fields is offered by Beaver Tractor Co., Stamford, Conn. Equipped with various attachments unit can be used for plowing snow, land leveling, mowing, etc. cutting large or small areas with either single or gang lawn mowers, grading and mulch-laying, repair jobs. Tractor weighs 635 lb. empty, and is reported economical to operate. It will cut 40 in. for 7 1/2 ft. per ft. in operation in reverse as well as in forward, has changeable use wheel and Traction roller and other bearings. Rear and transmission unit cast in aluminum.

High-Speed Nut

New off-loading nut, designed to withstand sustained temperatures of 550 F., is stated to be easily removed after exposure to such heat without softening of use and built in galling of die threads. Made by Hurst Nut Nut Corp. of America, Union, N. J., unit is made only of low brass. Long spin requirements will suffice what is possible with a plain bearing or bushing but affording all the advantages of anti-friction operation. Type is full size with 1/2 in. diameter. In fact, unit can be machine finished, and tolerances as .0005 in. Devoted to either in both chrome alloy bearing steel (SAE 51100) and 4140 stainless steel in weight of 3 gms.

Non-extrusion Ring Packing

Designed for ground search refrigerating and static hydraulic sealing, ring packing, intended to eliminate drag aging effect of extrusion of packing material into clearance space between rotating parts, is marketed by Greenlee & Co., North Wilton, Pa., as Filonite G-1 Ring. Device consists of resilient ring of synthetic rubber or Teflon backed up in supported on each side by non-extrusion ring retainers or guards, split and made of laminated phenolic material. When operating pressure is increased, range of ring expands radially against non-extrusion rings, holding them in contact with the surface of cylinder or piston rod. Packing may be used in systems where the temperature range is from -70 to 250 F. and a cleaned unit to lock or fail over extended operation with pressures from 1 to 5000 psi. Laboratory tests have been at 10,000 psi. Only application not suited for these ring packings is systems employing continuous rotation, rotation.



Low-Temp Rubber Compound

New synthetic, butadiene-based rubber compound, offered by Standard Rubber Co., 178 Northfield Road, Redford, Ohio, is reported as especially suitable for numerous applications in which rubber must withstand very low temperatures for prolonged periods of time and still retain flexible qualities in its normal condition. Material is stated to withstand effects of temperatures as low as -100 F. It has permanent set of 4 percent, specific gravity of 1.25, dimensions hardness of 55, and remains unaffected by dilute acids, alkalis, petroleum products, hydrocarbons, and solvents. Another feature is resistance to oxidation at high temperatures. Compound can be extruded into channels, sheet or punched into gaskets, washers, and gaskets and molded to shape. It's stated that special additives can adapt it for almost any required application for lasting, expanding, shrinking and compression and elongation can be "tuned" to meet individual specifications.



Miniature Ball Bearing

For small installations such as electric motors, see following, and electric vibrators, ball bearing with extremely low friction has been developed by Messrs. Perbore Bearings, Inc., Kent, N. H. Accepting 1/8 in. shaft, new words only few hours in long spin requirements will suffice what is possible with a plain bearing or bushing but affording all the advantages of anti-friction operation. Type is full size with 1/2 in. diameter. In fact, unit can be machine finished, and tolerances as .0005 in. Devoted to either in both chrome alloy bearing steel (SAE 51100) and 4140 stainless steel in weight of 3 gms.

FINANCIAL

Equipment Trust as Financing Aid

Some legal questions resolved, other obstacles to plan remain; ICAO lauded for work on recognition of rights.

With the problem of securing new aircraft becoming more acute for an increasing number of airlines, the use of all types of financing to the aircraft industry has become a permanent necessity.

Perhaps the greatest potential aid in the present is the wider utilization of equipment trusts as an instrument of airline finance.

In many instances, during the heavy capital expenditures payable any other form of financing, but the equipment trust device. Certainly, if this financing medium were used at the outset in new ventures, it is highly probable that the industry as a whole would have emerged through its transition period in sounder condition.

► **Equipment Trust**—The equipment

trust device has fully demonstrated its attractiveness in railroad financing. The principle of "non-recourse" which underlies this type of paper is best suited and has received numerous court and national recommendations. The fact that it has held up well in the airline industry is evidence of its relative non-recourse nature in cases where initial capital was at low ebb.

Secured by the actual selling stock, the equipment trust has served numerous financial difficulties.

The air transport industry could not apply this same financing device during its early development, due to various legal complications.

At one time, an equipment trust device could be held liable in case of the aircraft if it were involved in an

accident. Further, in the recent past there was no satisfactory method of recording interests in engines and spare parts.

► **Obstacles Removed**—Largely as a result of recommendations advanced by the Congressional Aviation Policy Board, both of these legal obstacles were removed by the last Congress.

Most favorable is the clarification of the legal question of ownership of navigable airline property in bankruptcy. Under existing conditions, a secured creditor can not legally mortgage operating property, unsalvageable. While the Congressional Aviation Policy Board recommended to adjust this problem was presented to the Congress, it was found that the enactment of such necessary provisions would necessitate a complex overhaul of existing airline legislation.

To facilitate the necessary banking overhaul, it is believed that revision of the Bankruptcy Act can be necessary. This will no doubt be attempted at the present session of Congress.

► **Changes Needed**—The effect of such changes as have been accomplished in aviation. The leasing plan sponsored by Congress would have been virtually impossible were it not for clarification of the aircraft and spare parts and the elimination of

potential liability on the part of trustees in event of accident of the second aircraft.

All the equipment trust device can hope to accomplish is to afford the airline with greater flexibility in their financing program. It is no concealment, and fundamentally, the individual credit of the borrowing airline will remain the key consideration.

A far-reaching constructive attempt to lend this flexibility to the airline is present in the International Civil Aviation Organization's approved Convention on the International Recognition of Rights of Aircraft. Under the leadership of Roscoe B. Adams, Civil Aviation Board member and chief U. S. delegate to the ICAO Assembly, the draft convention on the recognition of aircraft rights was endorsed by 28 majority countries.

► **Recognition Needed**—However, to implement this convention, it now becomes necessary for each country to ratify the action of the ICAO Assembly. A determined attempt will be made at the present session of Congress to approve and sustain the U. S. delegate's action of last June.

It is the hope of the constructive revision of the airline and banking laws that the Congress will satisfy the airline. The public has little appreci-

ation of the sheer magnitude of the achievement accomplished by the U. S. delegation in obtaining a positive outcome of agreement among 28 countries in the approved draft convention.

This matter, as the first secretary of the Interdepartmental Committee on Facilitation of Civil Aviation, recalls the difficulty in obtaining agreement among a number of diverse agencies so that a united U. S. position could be presented before the ICAO Assembly. Certainly, the molding among government departments of U. S. views on the international recognition of aircraft must have been an equally tortuous process. And after this has been achieved, to obtain agreement among 28 countries is a great accomplishment.

► **Have Influence**—This becomes even more significant when it is recalled that for 22 years international law has failed to reconcile conflicting national law on the subject. Out of all this, the basic difficulty was that more nations with legal systems based on Roman law do not have anything comparable to the English concept of the chattel mortgage.

There has been a major key to banks and aircraft builders seeking a form of security law loans to place purchases which would rank as high as a first mortgage no matter where the plane

is. In many countries, under existing statutes, the least and attachments resulting from indebtedness of the operator for supplies and other kinds of claims may take priority over a mortgage.

The approved convention establishes the principle that property rights including mortgages, considered as an incident with the law of one contracting state, shall be recognized in all other contracting states as having priority over all other claims on a plane in its operation. An exception is made for claims arising out of salvage operations or expenses incurred for action beyond what is possible to the preservation of the aircraft.

► **Compromise Spent**—The fact that agreement was reached by 28 countries is evidence of the value of compromise which must have been provided.

While the convention will be limited to those countries approving the agreement, a significant area of the world is included and is bound to be extended.

For this reason, it becomes very important for Congress to approve this proposed convention. It is known that many other countries are inclined to follow the U. S. lead in such matters. A single exception to the early ratification by other nations is bound to follow quick U. S. approval.

—Selig Akshol

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SALES AND SERVICE



New Wing Ups Cessna 170 Performance

Price increased \$300
on improved model of
popular four-placer.

By Alexander McFarley

The new 1949 Model 170 Cessna four-placer with an all-metal wing will be priced at \$1995. Cessna Aircraft Co. announced at a meeting of the company's distribution this weekend.

Designed to cruise at over 125 mph with five passengers (full fuel) load and 100 lb. of baggage, the plane has a range at this speed and under these conditions of well over 500 miles, the manufacturer states. Top speed is quoted at over 140 mph, and landing speed at 45 mph.

► **Price Increase**—By replacing the fabric-covered metal structure wing used on last year's 170, Cessna has put its best wing model of 1948 as a definitely advantageous position for 1949, and with a price increase of only \$300.

Latest figures available show Cessna sold 654 of the 170s in the first 11 months of 1948. Considering the plane was not introduced until December 1947, and that only a few were sold in the first months of 1948, the Cessna Model 170 was definitely the best accepted four-placer of the year.

(The Service Voyager on the basis of 11 months figures led the 170 in total planes shipped for the year, with 801. This was due to larger Voyager shipments in the early part of 1948 before the Model 170 "caught on.")

► **Best Spin**—The new tapered all-metal



Tapered planform of new all-metal wing and new standard dual (in colors) push 1949 Model 170. New single (in blue) standard wing is shown below. Craft is designed to

cruise at over 125 mph, land at 45 mph. Range of the Model 170 is over 500 miles. It is powered by Continental C-140 engine.



BRIEFING FOR DEALERS & DISTRIBUTORS

SHORTER CROSSWIND TAKEOFFS—An NACA investigation of crosswind gust plane performance with a two-engine Piper Cub shows that the reversing-gust plane can save runway for takeoff with side winds that in calm air.

The research agency reported to CAA, which had asked for the investigation, that the light plane will fly 15 ft less runway on takeoff with side winds of 11.4 to 19.5 mph than it did with virtually calm air conditions of 0.6 to 3.3 mph. With a 40-mph takeoff speed and with the side wind averaging 16.4 mph, the reduction in takeoff amounted to 24 percent (75 ft). At a higher takeoff speed of 50 mph, the reduction in takeoff was 22 percent.

CAA officials say that the test establishes the use improved techniques of the length of runway required for angle-of-attack approach, indicating that length need be no greater because of this condition. Indication is that CAA will push vigorously to minimize multiple-direction runway construction of new airports. John Giese, consultant for CAA, says that as long as multiple runways do not intersect, they could be used simultaneously regardless of wind direction, by planes with constant gear.

BONANZA CHARTER SERVICE—Charter service with Beech four-place Bonanzas is available from 65 Beech dealers and distributors in 14 states; the manufacturer has announced Bonanza service to qualified pilots can be available from 42 of these same dealers and distributors.

COMMUNITY AIRPORT PLANNING—A new CAA publication "Community Character of Communities," is designed to show the types of information needed in planning an airport for a community, in addition to the usual population of a community.

Beech, the publication presents a new means of market research in the field of airport planning, showing how to analyze the manner in which people at a given community use their facilities, the extent toward which movement and travel enters into that community's economic life, the manner of earnings the way earnings are spent, and other similar factors.

The research method, CAA states, has been tested in approximately 160 cities, surveys, and is made available as a guide for community airport planners. The study shows generally that communities which are manufacturing centers or are industrial in character (with large government or educational centers) have higher airline passenger potential, higher per capita incomes of registered aircraft, and higher average annual air travel expenditures per person, than communities with major industrial sectors, or a balance between industry and manufacturing.

FLAME RESISTANT FINISH—Monomax Chemical Co. has announced it is making its Sylux flame resistant aircraft finishes available in the private airplane field. The finishes were developed for commercial aircraft and approximately flame retardant U. S. domestic airlines have standards on Sylux interior or exterior finishes.

The manufacturer states that the liquid's resistance to flame is superior to that of any readily commercially available material. Cost of doing a light plane with Sylux is reported comparable to that of conventional materials; flame does not become faster than Sylux are required for a structure, increasing and protective coating.

MORE ON PIPER-ATKINSON—Approximately 700 Stinson dealers will be added to the 1500-man Piper dealer organization as a result of the recent purchase of Stinson division of Consolidated Vultee Corp. by Piper Aircraft Corp. (Wichita, Kan. Div. 6, 1945).

President William T. Piper says the 1949 Piper line will include four two-place models and four different four-place models from the two-place 65 hp. Vagabond listed at \$2810 to the Stinson Flying Station Vagabond listed at \$6185. Piper definitely will continue manufacture of the Stinson line as it stands, after tools, jigs and other equipment are transferred to Lock Haven from Wayne, Mich.

—ALEXANDER MCMURRAY

wing has the same span (36 ft) and the same wing area (175 sq. ft.) as the old fabric-covered wing. NACA tested 2412 in wind. A single lift strut replicates the old double strut arrangement.

Wing chord is 64 in., constant from wingroot to strut attachment and 44 in. outboard to wingtip.

A larger rounded dorsal fin similar to that used on the larger Models 190 and 191 is used on the new 175, giving improved directional stability. Elevator control system has been redesigned to reduce control loads at landing, and column control is reported more sensitive than on last year's model.

Increased flap area, and greater down travel (to 54 percent) had improved pitch control in the whole range of approaches, the manufacturer states. A new positive flap control system is designed to prevent flaps from being blown down while the airplane is going down while the airplane is going down.

Weight easily is reported just under 1200 lb., slightly less than last year's weight easily. Cost is reported at 2300 lb. Fuel capacity has been increased slightly to 45 gal. A new quantity fuel system eliminates fuel pump installation.

Swire Engine—Place is powered by the Continental C-145 engine rated at 161 hp for takeoff. The engine, which was new last year with the engine, has been subjected to several engine modifications which have added extra life to its serviceability. These include, the plane company states, standard manifold gauges, improved carburetor fuel subject in vent, and new seat belt plug.

Interior of the fuselage has been sprayed with a soundproofing material which lowers the noise level during operation. Seats have been redesigned for improved comfort, and a new cabin upholstery of a new fabric and leather trim is offered.

In Production—The new four-place is already in production, and the entire distributor and dealer organizations is expected to receive demonstration aircraft the next few weeks.

While detailed announcements on other Cessna 1949 models has not been made, they are expected to include among the two-place models 120 hp (with 55 hp. engine) and 140 with 90 hp. in engine, and the large four-to-five place models 190, with 90 hp. Continental, and 195, with 100 hp. Jacobs engine.

Although the manufacturer has sought to design its entire production line to make, in many components as possible interchangeable from one model to another, the new 175 wing is not adaptable to the large 190 and 191s which use a full cantilever all-metal wing.

The 1949 two-place model are expected to continue with the new fabric-covered metal construction wing used for the 1948 models, at least for the time being.

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with the famous Blue-Point Trade Mark



... have the construction features for smooth, powerful operation ...

COMPLETELY ENCLOSED MOTOR: Super-powered, premium balanced motor encased in permanent die-cast iron housing.

BALL BEARING CONSTRUCTION: Overcast, grease sealed ball bearings and thought-out, smooth motor operation.

LAKE BRUSH ROLLER: Rubber free, positive seal, mounting free from vibration. Re-sealed ball bearings for permanent smooth running.

BRONZE ROLLER MOTOR: Develops less heat in the windings — more desirable for continuous operation.

STURDY TOOL HOLDER: Adjustable for any type of work with simple turn-key forward movement.

LARGE WHEEL COASTER: Allow you of special shape grinding wheels or wire brushes. Coaster feed with chip holders.

BALL TYPE CONSTRUCTION: Provides ball clearance so that long straight pieces may be ground across the face of the machine.

CAPACITOR START MOTOR: Uses low starting current — actually less than 15 amps.

VOLTAGE: Standard models of 10 1/2 HP. and 15 1/2 HP. grinders require 110 Volts, 50/60 cycle AC current; standard 1 HP. grinders take 220 Volts, 50/60 cycle AC current. Special voltage models available.

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Who was First?



WHO WAS FIRST to apply the age-old principle used by the Indians in building back-birds (cones), to the development of "patented" thin "bottle-neck" compressors? Answer: *First patent* "bottle-neck" compressor (patented) was issued to P. E. Leach in 1936.



WHO WAS FIRST to apply the scientific approach to the development of human flight? Answer: *Leonardo da Vinci, the famous Italian scientist, is credited with the first study of birds in determining the value of wing area in flight load.*



WHO WAS FIRST to apply Newton's third law—the every action there is an equal and opposite reaction into the design and construction of a jet-propelled airplane? Answer: *The first jet-propelled airplane was designed by General and Baron von Hehn (1910) in 1910.*



WHO WAS FIRST to apply the design principle used by the ancient Egyptians for control of water in dams and air gates, to the design and construction of a jet-propelled airplane? Answer: *Wm. E. Whittaker Co., in 1942.*



More than half a decade ago, Whittaker designed and perfected the first design and construction of a jet-propelled airplane. Today, Whittaker's jet engines are the most powerful and efficient jet engines ever built. Whittaker's jet engines are the most powerful and efficient jet engines ever built. Whittaker's jet engines are the most powerful and efficient jet engines ever built.

Whittaker

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First in PERFORMANCE

First WITH VALVES THAT ARE FIRST ENGINES IN INDUSTRY

AIR TRANSPORT

Preliminary Traffic and Financial Results Certificated Domestic Trunklines

Traffic	1947	1948
Domestic passenger miles	8,615,402,000	8,850,140,000
Mail ton-miles	17,176,000	17,526,000
Revenue ton miles	23,620,000	24,420,000
Private letter miles	20,112,000	20,612,000
Domestic freight ton-miles	3,726,771	3,726,000
1948 Domestic ton-miles	4,012,000,000	4,012,000,000
Revenue		
Passenger	\$102,140,500	\$102,877,000
Mail	12,170,000	12,170,000
Freight	10,000,000	10,000,000
Private letter	4,250,000	4,250,000
Domestic freight	1,900,000	1,900,000
All 1948	1,300,500	1,300,500
Total operating revenue	\$128,460,500	\$128,460,500
Operating Expenses	\$107,170,471	\$107,170,471
Net Operating Income	\$21,290,029	\$21,290,029
Revenue Miles		
Domestic passenger miles	8,615,402,000	8,850,140,000
Domestic freight ton-miles	3,726,771	3,726,000
Domestic passenger miles	8,615,402,000	8,850,140,000
Domestic freight ton-miles	3,726,771	3,726,000
Domestic passenger miles	8,615,402,000	8,850,140,000
Domestic freight ton-miles	3,726,771	3,726,000

1948 includes mail based on revenue official reports for year months, preliminary figures for October and November for December and December.

Did Carriers Make Money in 1948?

Overall industry result depends on final mail rates, feeders and flag carriers seem sure to show profit.

With the end of sharp gains reported by international operators and the airlines, U. S. certificated carriers handled more traffic and did a larger dollar volume of business in 1948 than ever before.

And when final mail rates are set by the Civil Aeronautics Board, last year may prove to be a profitable one for the industry as a whole.

► **Revenue-Ton-Mile Volume**—The Air Transport Association estimates that U. S. certificated carriers-domestic and international trunklines and the feeders—decreased 963,594,674 revenue ton miles of passenger, mail and cargo in 1948, compared to 926,484,273 in 1947. Revenue passenger miles declined from 7,667,330,000 in 1947 to about 7,764,746,800 last year. But increased freight, express and mail business boosted the overall ton-mile figure to the new peak.

Operating revenues for the industry as a whole climbed from \$509,940,608 in 1947 to an estimated \$645,944,849 last year, a gain of 13 percent, or more than 573 million. Operating expenses rose from \$991,781,563 to about \$693,777,203, up more than 575 million, or 11 percent.

► **Passenger Traffic**—Domestic trunkline traffic set opening losses for the entire industry climbed from an all-time high of \$1,360,350 in 1947 to about \$1,718,344 in 1948. The ATA estimates for 1948 do not include most routes to and from mail pay members for National Airlines, Northwest Airlines, Capital Airlines, Colonial Airlines, Western Air Lines, and Eastern Air Lines.

The domestic trunkline estimated

operating loss for 1948 as \$1,019,604 at \$11,019,600, against \$1,019,604 in 1947. In the ATA estimates, last year's deficit may have been cut by \$5 million through CAR's latest mail pay decision.

When final mail rates are set for both domestic and international operators, the tentative \$5,735,161 industry-wide operating deficit for 1948 may be wiped out completely. Even without further adjustments, U.S.-flag international operators as a group and the feeders as a group should show operating profits for 1948.

► **Passenger Business**—The 1.3 percent decline last year in revenue passenger miles flown by all U. S. certificated carriers was accounted for entirely by a slump in the domestic trunkline passenger business. From 6,010,675,000 revenue passenger miles in 1947, domestic trunkline traffic fell to about 5,800,100,000 passenger miles last year, down 1.5 percent.

By contrast, revenue passenger miles flown by American flag international and express carriers rose 4 percent from an estimated 1,518,092,000 in 1947 to 1,555,000,000 in 1948. Feeders flew an estimated 31,668,000 revenue passenger miles last year, up sharply from the 46,410,000 reported in 1947.

► **Freight Traffic Boost Revenue**—Despite the overall passenger traffic decline, passenger revenue gained about 7 percent. This was due primarily to increases in mail and express per domestic passenger mile flown. Last year, 5.84 cents in 1947 to 5.65 cents in 1948. International rates rose very slightly from 7.77 cents a passenger mile in 1947 to 7.88 cents last year.

Average passenger load factor for the domestic trunkline in 1948 was about 58.3 percent, down from 65.7 percent in 1947. International passenger load factor also declined, from 69 percent in 1947 to 57.5 percent last year.

► **Freight Payors Gain**—In 1948 as in 1947, the greatest freight increases took place in the cargo field.

The domestic trunkline flew about 65,760,000 freight ton miles in 1948 compared to 53,118,956 in 1947, while express ton miles rose from 26,573,502 to about 30,452,000.

American flag carriers' freight revenue soared from 2,399,899 in 1947 to 5,745,000 in 1948. International revenue traffic increased from 16,794,946 ton miles in 1947 to 19,765,000 last year.

► **Mail Tonnage Increases**—Aided by a suspension of parcel post service, and low rates drawn by the domestic trunkline, mail tonnage increased from 12,878,825 in 1947 to 17,216,000 in 1948. Domestic U. S. mail ton miles rose substantially by American carriers climbed from 12,567,000 in 1947 to 15,571,000 last year. Domestically, revenue per mile: for

Preliminary Traffic and Financial Results Night and Overseas American Flag Carriers

	1947	1948
Revenue passenger miles	1,219,000,000	1,894,000,000
In U.S. domestic	12,000,000	12,000,000
Foreign mail ton-miles	1,000,000	1,000,000
Revenue ton-miles	2,019,000	2,794,000
Private ton-miles	2,019,000	2,794,000
Total revenue ton-miles	3,038,000	3,688,000
Revenue		
Passenger	\$140,000,000	\$140,000,000
Freight	\$10,000,000	\$10,000,000
Cargo	\$10,000,000	\$10,000,000
Express	\$10,000,000	\$10,000,000
Postage	\$10,000,000	\$10,000,000
Telegraph	\$10,000,000	\$10,000,000
All other	\$10,000,000	\$10,000,000
Total operating revenue	\$190,000,000	\$290,000,000
Operating Expenses	\$100,000,000	\$100,000,000
Net Operating Income	\$90,000,000	\$190,000,000
Adjusted Net Income		
Passenger mile revenue	\$11.5	\$11.5
Revenue ton-mile freight	\$11.5	\$11.5
Revenue ton-mile cargo	\$11.5	\$11.5
Revenue ton-mile express	\$11.5	\$11.5
Revenue ton-mile telegraph	\$11.5	\$11.5
Revenue ton-mile all other	\$11.5	\$11.5
Revenue ton-mile operating expense	\$11.5	\$11.5

Note: Traffic revenue and expenses for first quarter of 1948 were estimated. Profit figures for year will depend largely on percentage mail payments as per contract.

ate, NWA's proposed Washington, D.C., to Minneapolis flight will be withdrawn by the carrier (Aviation Week, Jan. 3).

Flying Tigers Report Peak Fourth Quarter

The Flying Tiger Line, premier all-cargo carrier, finished 1948 with an up surge in traffic and earnings.

President Robert W. Pease said the company's business hit a new peak in October and that the fourth quarter was the best ever. The carrier, which has been reorganized for a C-54 operation, has had operating profits since July and net profits through the fourth quarter of 1948.

"Our record this year, when the Civil Aeronautics Board put a floor under freight rates, proved the soundness of the tariff structure," said Pease. "Before the Board ruled the rates all of us were being taught at school. But the tariff competition brought about by the effects of certain interests to put independent aircraft carrier out of business has now been stopped, with the result that the industry is on its way toward making a profitable and useful contribution to the nation's air transport system."

Pease said Flying Tiger's operating revenue aggregated about \$100,000 in October, up 21 percent over September and 180 percent over last January. Freight ton miles flown this year should more than double 1947's total of 1,654,000. The company lost about \$250,000 during the first half of 1948.

On Sept. 10, the C-54 and DC-4s, including 78 pilots and co-pilots. Equipment has been leased on a number of occasions to non-scheduled transoceanic passenger service.

AOA '48 Profit Tops \$1 Million

American Overseas Airlines earned an indicated profit of over a million dollars during 1948 and transported more than one-third of all North Atlantic air passengers.

The earnings estimate is projected on a \$1,181,000 profit for the first eleven months of 1948 before period adjustments and determination of final audit costs.

On trans-Atlantic operations, AOA flew 71,000 passenger in 1948, as against 11,6 percent over 1947. Cargo totaled 2,215,000 lbs., up 51.1 percent, and mail 1,311,100 lb., up 16.9 percent over the previous year. As additional cargo, 75,700 passengers were carried between Frankfurt and Munksgaard, Berlin, to

gether with nearly 8000 tons of cargo and 122 tons of mail.

Last year, AOA flew 21 percent of the total air passenger traffic over the North Atlantic during the first eleven months of 1948, and its scheduled share was 21.3 percent. An application for approval of longer than Asia routes is pending. The carrier (Aviation Week, Dec. 29), but AOA officials say the move is not affecting their company's current operations.

Lump Sum Offered As Back Mail Pay

More than a million dollars in retroactive mail pay is in prospect for Western Air Lines and its subsidiary, Inland Air Lines.

The Civil Aeronautics Board has allowed Western's retroactive mail pay aggregating \$4,532,000 (\$142 cents a plane mile) for the period May 1, 1944, to Dec. 31, 1948. This would give WAL \$975,000 more mail pay for the period than it had received and its financial status would enable the carrier to receive a 7 percent net profit on its scheduled air transport for the 16-month period.

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On Sept. 10, the C-54 and DC-4s, including 78 pilots and co-pilots. Equipment has been leased on a number of occasions to non-scheduled transoceanic passenger service.

The carrier would get 15 cents a plane mile for the first eleven months of 1948, but its passenger load factor was below 55 percent. CAB estimates the company would break even under the new formula with slightly less than a 50 percent load factor.

For each 1 percent increase in WAL's passenger load factor above 50 percent, the maximum base mail rate will be decreased by 1.40 cents a plane mile. The maximum base mail rate of 540 cents a mile will be reduced to 500 cents a mile when the load factor is 72 percent or higher.

CAB estimates that Western would earn about 7 percent net profit on its air transport at a 55 percent load factor. With a 70 percent load factor, despite

the lower mail rate, it could earn an estimated 14.7 percent profit. But with a 50 percent load factor the net profit would be only 1 percent under the higher mail rate would not balance the lower passenger income.

Long Term Oilfield-Related Air Lines said it offered lump sum mail pay of \$1,000,000 (57 cents a plane mile) for the period May 25, 1947, to Dec. 31, 1948. This would give Inland \$75,000 more income than it received under the previous formula and yield the carrier a 7 percent net profit for the 21-month period.

Starting Jan. 1, 1949, Inland would receive a sliding scale incentive mail formula providing a maximum of 30 cents a plane mile each month. But the company's load factor falls below 51 percent. With a 70 percent load factor, Inland would receive only 18.26 cents a plane mile mail pay but would earn about 15.3 percent net profit on its air transport. Regardless of the maximum and rate received, Inland would probably lose money during later months when its passenger load factor drops below 50 percent.

CAB estimates Western will receive about \$1,390,000 more mail pay under the future under its formula. Inland will receive an estimated \$610,000 annually.

AA: No More DC-3s, DC-4s After March

C. R. Smith, American Airlines' chairman, believes his company will have a profitable year in 1949 at a reasonable level of general business activity is maintained and if mail rates are maintained at the present level.

In a recent interview of 1948 results, Smith disclosed that the last of American's DC-3 and DC-4 passenger planes will have been retired by the end of March, being replaced by DC-6s and Convair-Lears.

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Smith said that American now has made a profit in the fourth quarter. The carrier's net profit for the fourth quarter was \$1,390,000, or 7 percent of the total revenue of \$10,000,000.

Large manufacturing expenses, particularly the cost of training and other items incident to introduction of new aircraft types—related American's net profit to the current year. These expenses will be reduced substantially in 1949, Smith said, with consequent beneficial effects on potential profits.

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Cargo Volume Up For PAA Division

Pan American Airways' Latin American division is looking retrospectively at 1948 as its greatest year of accomplishment.

Added to the addition of ten C-46s loaned from the Air Force, the division boosted its cargo volume in record levels. Passengers reduced slightly, but LAR's unblemished passenger safety record was maintained.

Expansive Prodomex-Cargo flow from Denver aggregated about 25,071,422 lbs. against 20,007,000 lbs. in 1947. Airline reports to Latin American as well as the Caribbean, but the latter's unblemished passenger safety record was maintained.

During the first ten months of 1948, Latin American's cargo volume and tonnage were up 10 percent over 1947. The carrier's cargo volume and tonnage were up 10 percent over 1947. The carrier's cargo volume and tonnage were up 10 percent over 1947.

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made flown by the airlines rose from 70,000 in 1947 to around 51 in 1948, and the latter figure may be somewhat understated by CAB figures. In contrast, the domestic freight tonnage carried only 19.8 cents per freight ton mile flown in 1948, down from the 24 cents reported in 1947, and express ton mile receipts dropped from 35.9 cents in 1947 to 12.4 cents last year.

CAL To Start Skycoach Service

Continental Air Lines plans to launch the Skycoach service.

President Robert W. Pease said the company will have a profitable year in 1949 at a reasonable level of general business activity is maintained and if mail rates are maintained at the present level.

The Skycoach service will be launched by the end of March, being replaced by DC-6s and Convair-Lears. Smith said that the last of American's DC-3 and DC-4 passenger planes will have been retired by the end of March, being replaced by DC-6s and Convair-Lears.

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needed to finance payments on its 20 Boeing Stearman aircraft. FAA told the Civil Aeronautics Board that Latin American governments have indicated the price they pay Latin American airlines for mail carriage.

Wage Increase

Pan American Airways and the Transport Workers Union (TWU) have signed a new contract providing 10 cents an hour wage increase for 4000 ground crew personnel throughout the country. PAA extended the pact until it comes in payroll by \$1 million in 1969. It raises the average hourly wage from \$1.49 to \$1.59.

The contract was for one year from Jan. 1, and agreement was reached after the union had threatened to strike. Majority of employees covered are at Pan American installations in New York, Miami, New Orleans, Houston, Knoxville, Los Angeles, San Francisco and Seattle.

AAA Plans Move

All American Airways, Wilmington, Del., plans to move its offices and operational headquarters to National Airport, Washington, D. C., on Jan. 15 and hopes to activate its conventional feeder routes around Feb. 15.

Since 1959 the company has conducted its mail and express pickup services on five links radiating out of Pittsburgh while maintaining general offices in Wilmington. AAA in February 1948 was designated for 15th miles of feeder routes in the same general Middle Atlantic area now covered by the pickup operation.

In selecting All American to operate

the feeder system, CAB said the new service could not be inaugurated until duplicating pickup routes were made, suspended or abandoned. A CAB statement last fall recommended radical rate suspensions of the pickup links (Aeronautics Week, Oct. 4), and a Board decision in the case is expected to be announced.

AAA plans to salvage its Wilmington-Pittsburgh route first, using specially modified 34-passenger DC-3s. Other segments of the feeder system are to be opened at three-week intervals thereafter.

Record Year for MCA

Mail Carriers Airlines carried more passengers over mail in 1948 than in any previous year, but President J. W. Miller expects that operating costs probably will prevent the company from showing a profit.

Upwards of 310,000 passengers loaded MCA-Cantair's DC-3s last year, compared with 269,189 in 1947. Freight tonnage totaled about 375,213, up 13 percent over 1947, while express tonnage was around 135,800, up more than 25 percent in comparison to the previous year.

Last for the first 11 months of 1948 was \$13,452, against a profit of \$11,671 for the same 1947 period. Although MCA has operated a Tulsa-Houston route since February, 1947, its reported revenues and earnings to date do not take into account the amount the company is entitled to for mail transportation over that link. Besides setting mail for the Tulsa-Houston service, CAB also must act on an application for higher mail rates over Mid Continent's Tulsa routes.



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fleet... and inland... the many productive farms... and the
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REPUBLIC AVIATION

Makers of the Rightly Thunderjet - Thunderjet - AR-12



OPEN HOUSE AT BOSTON

More than 35,000 persons passed Logan International Airport last month as American Airlines held open house to introduce its new Constellation, which usually stands service between Boston and New York. Nearly 700 persons took air tours over Greater Boston, and thousands more filed through a Constellation that was open for inspection. In many places, the Constellation

AA held courts to airline recreation for the \$2.90 engineering flight, that was piloted by a Constellation in addition to the Constellation, two DC-3s and a DC-4 were present in service to accommodate those wishing to make a flight. To the left of the Constellation Constellation is an American Airlines DC-4 sightseeing, which also was open for inspection.

Memo from AIRPORT DEPARTMENT PRATT & WHITNEY AIRCRAFT



To: Executive aircraft operators Private plane owners Fleet operators

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A personal visit phone call or mail will answer your questions and show the many advantages — to you — of being served by Pratt & Whitney's AIRPORT DEPARTMENT. An extensive, personal booklet available on request, illustrates and explains the wide range of AIRPORT DEPARTMENT facilities, points the way to better, faster service from your Pratt & Whitney engine and Hamilton Standard propellers.

AIRPORT DEPARTMENT
Pratt & Whitney Aircraft
Division, United Aircraft Corporation
Beechfield Airport
EAST HARTFORD, CONNECTICUT

Port Authority Suit Deadline Postponed

Part of New York Authority, scheduled to appear in court last week to answer the complaint, was out of town at the time. The International Airport (IAP), did not have to show up after all.

The 20-day time limit provided to answer the action expired Jan. 5 and the port agency was expected to appear days after that. But an agreement by the eight suing airlines and the Authority has extended the action deadline up to Jan. 24.

Meanwhile, a group headed by Howard S. Callahan, chairman of the agency, proceeded to Albany late last month to present its side of the story to Gov. Thomas E. Dewey.

It asked the governor to sue his finance in formulating any legislative action which might affect the Authority's autonomy from suit—at least until the airline dispute is settled. Dewey is said to believe in the general principle that all public agencies should be subject to suit.

The port agency's problems were noted in a closed conference at the executive chambers. The group went to Albany, Dewey said, "to lay the facts before me concerning their trouble with the airlines."

Reportedly, when asked if the Authority had made specific requests for action by the New York State Legislature in 1949, Dewey replied that they had "asked for nothing...and wanted me to know the facts. They want nothing done until the present controversy is settled."

Callahan indicated that he had made no commitments to the Port of New York agency.

Besides Callahan, those at the meeting were: Authority Commissioners David F. Pope, S. Blum, Carl, and Charles S. Hamilton, Jr. Others were Austin J. Tobin, executive director of the Authority, and Leonard J. Sheely, its general counsel.

Reorganize Airlines

(McClure-Hill World News)

KONBAY, India—A drastic reorganization of the Indian airline industry is on the books for 1949. Although pre-graduate and non-graduate pilots have been steadily increasing in the past two years, they have been lacking an incentive had situation which includes the following factors:

- Of nine operating companies only one, Air India, has been able to show a profit.
- Of the 13,600 route miles being flown

only about 7800 is considered productive of profit.

• All the airlines have been operating under one-year renewable licenses. This has prohibited sound long-range planning.

Since the Indian government is strongly opposed to subsidies, because of its financial limitations, the only way out appears to be an amalgamation of many of the existing companies.

• **Accomplished**—This development is indicated strongly by announcement that the licensee board will set this spring its initial long-term license to financially and technically sound companies, and the licensee board will move to eliminate "wasteful and unhealthful competition."

Industry circles state frankly that the latter step must include mergers, for three operators show that there are four airlines using hardly more than half the 1949 aircraft now in service could handle the same traffic at a now being moved. And the losses in duplication of planes, airports and maintenance facilities would put the whole industry into the black for the first time.

SHORTLINES

► **Bozell**—This articulated a first-of-the-week locally travel plan providing for full-line flights on Mondays, Tuesdays and Wednesdays. Assistant Chief Pilot W. B. Walker has been selected to instruct and qualify for flight duty all National Airlines DC-6 pilots who returned to work following retirement.

Of the course, ALPA strike against National Airlines.

► **Capitol**—Has accepted a CAB offer providing (A) \$3,150,000 additional, temporary paid pay for the period Jan. 4, 1947, to Dec. 31, 1948, and (B) half-way pay for the period Jan. 4, 1949, to Dec. 31, 1948 (Average Wage, Jan. 7).

► **Colson**—Has accepted a CAB offer providing \$12,900 additional paid pay for the period Jan. 15 to Dec. 31, 1948, and \$619,000 additional for the period Dec. 19, 1946, to Apr. 30, 1948 (Average Wage, Jan. 7).

► **Continental**—Has asked CAB authorization to start service between Denver, Colo., and Casper, Wyo., via Cheyenne and Newcastle, Wyo. Carriers see the need for additional transportation to the Casper-Newcastle area has increased because of oil exploration and development activity.

► **Hawkins Wilson**—U. S. Department of Justice has filed a civil suit against the shipping firm, seeking to force the shipping firm

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to dispose of its continuing stock interest in HAI, the only certified air carrier operating between the Hawaiian Islands.

► **Pan American**—has inaugurated half-hour Sunday nighting flights from Miami International Airport. Tickets for the DC-4 and Convair-Lear jets are \$345. TAA has signed an agreement with British Transavia Airways whereby any Pan American sales office in the U.S. will be able to can ferry space immediately on REA's flights from London to Paris, Amsterdam, Geneva, Copenhagen, Stockholm, Maastricht, Rome and Athens.

► **Trans-Canada**—has adopted the first all-weather, hourly full rate plan.

► **Stolt-W. B. Langmore** has resigned as vice president and treasurer and will remain on the board of directors. David R. Stewart succeeds Langmore as treasurer of the freight carrier.

► **Trans-Canada**—Express is moving the equipt of the three DC-7s to use on the Vancouver-Seattle run from 21 to 25 passengers. Modification is to be completed by spring.

► **TWA**—Will inaugurate service to Zurich, Switzerland, on Jan. 30. Convair has accepted a C-46 offer in coming fuel gas on the international routes by \$2,512,000 for the first 11 months of 1948.

► **United Mail** and freight volume hit an all-time high during the first two weeks of December. Parcel post volume is about 50 percent of the total tonnage flown in U.S.

CAB SCHEDULE

Jan. 16—First departure to (Continued)
 Air Lines route (Continued) (Jan. 16)

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 Air Lines route (Continued) (Jan. 16)

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KEYS ABOUT PEOPLE—Miss Pauline Perry, who was War Against Rape for American Nurses, has been appointed publicity director of the Washington Evening Star's radio stations, WMAL and WMAL-TV, and of the American Broadcasting Co. in the Capitol. Further, she was with the Yoko Ono, American Action, and Women's Relief committees last year's soldiers' affair.

EMPLOYMENT		
Persons Employed	100	100
Persons Unemployed		100
EDUCATIONAL		
Below	100	100
At least		100
LANG. SPEECH		
Used as Service Now		100
By Sex	100	100

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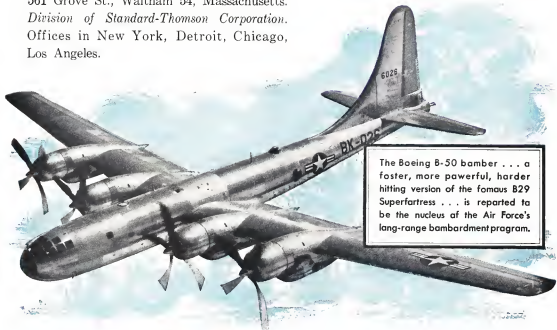
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